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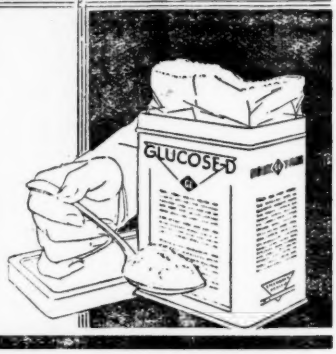

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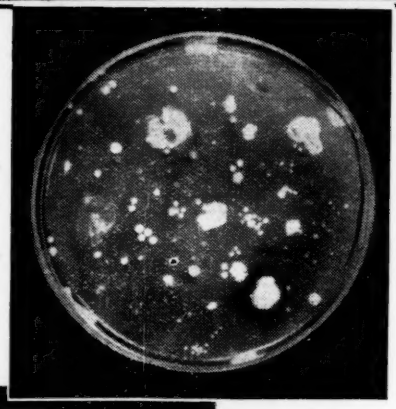

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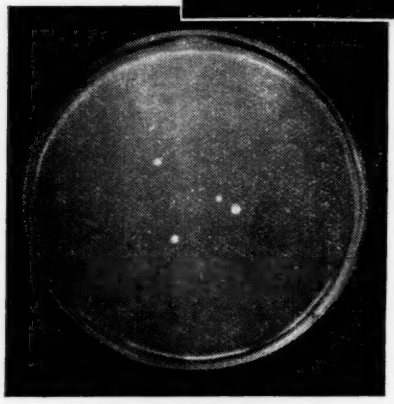

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Vol. III] *Calcutta : December, 1933.* [No. 4

Studies on the Periodicity of Defective Function of Human System as Distributed in the Phasial Cycle of the Moon

Part I

H. CHOWDHURY, M.SC. M.B.

INTRODUCTION

The people of Hindusthan specially the Hindus have a tradition handed down to them from the philosophers of the vedic age that certain days, expressed in terms of the phasial cycle of the moon, are bad for taking some kind of food and doing certain deeds, because on these days there is a natural indisposition of health. Embodiment of these statements are very frequently found in the old prehistoric philosophical works of the Hindus. It is generally stated that the 8th, 10th, 11th, 12th, 14th and the 15th of the waxing and waning days are unsuitable for certain purposes,

Few years ago, while making some observations on eclamptic cases, I tried to distribute the case incidences in the phasial cycle of the moon in a graphic form and which indicated a clear evidence of greater prevalence of incidences of this disease on those days.

Similar observations in course of private and hospital practice on cases of insanity, asthma and gout also convinced me of the above fact as fresh incidences of such ailments and exacerbation of symptoms of already existing disease on these days, were very marked.

While it is unwise to be led away by such concepts, I thought it might be profitable to try to find out the real underlying truth if there is any of these statements. So I started, to begin with experimenting on healthy individuals with with a view to find out periodicity of defective function of our body if there be any as distributed in the lunar cycle.

EXPERIMENTAL METHODS

The experiments were undertaken in several groups.

1. In the 1st group the function of kidney, (an excretory organ), was tested,

2. In the 2nd group the function of liver, (the chief organ of digestion and metabolism), was tested,

3. In the last group several solitary experiments were done for the verification of the facts observed in the above two groups.

Subjects chosen were healthy human adults, age varying between 20-25. These men were made to fast for a period of 14 hours from 6 P.M. of the previous day to 8 A.M. next morning. The previous meal used to be an ordinary one consisting of rice, dal and fish curry. Immediately before the starting of the experiment they were made to attend to nature's call, after which they were treated it various ways in different experiments as follows :

Experiment 1.

In this investigation, tests for kidney function were carried out by the Straus and Graunwald

method (provocative polyuria test) with the modification that in my cases only 500 c.c. of water was given. Urine was collected every ½ hour for a period of 2 hours.

In one case the experiment was carried out for a period of 7 months, in the second for 5 months, in the third for 3 months. Besides these 24 hours' collection of urine have been done in two cases for a period of 2 months, in one the water ingested was also taken into account.

Results have been charted in terms of lunar cycles, month by month, but the graphs have been drawn of the mean readings for particular phases for the whole period. [*See chart*—1]

From the above set of experiments it is found that there is a deficient elmination of water by the kidney on the 3rd, 4th, 9th and 13th days following either new or full moon days and also on full and new moon days themselves. STRAUS AND GRAUNWALD in their experiment explained them to be due to defective kidney function. But I shall reserve my remarks on this point till I have gone through the whole group of experiments.

Further scrutinising examination of the readings shows that :

(1) *In Dr. Chowdhury's case,* where the experiment was carried for a period of 7 months,

(*a*) the average elimination in 2 hours after 500 c.c. of water was—497c.c.
(*b*) the largest amount eliminated in 2 hours during that period was—726 c.c.
(*c*) the smallest amount climinated in 2 hours during same period was—258 c.c.

(2) *In Poke's case,* where the Experiment was carried for a period of 6 months

(*a*) the average in 2 hours—534 c.c.
(*b*) the largest amount in 2 hours—875 c.c.
(*c*) the smallest amount in 2 hours—220 c.c,

(3) *In Pontya's case,* where experiment was carried for a period of 3 months.

(*a*) the average in 2 hours—544 c.c.
(*b*) the largest in 2 hours—1000 c.c.
(*c*) the smallest in 2 hours—210 c.c.

(4) *In Rambabu Singh,* where the experiment was carried for a month only.

(*a*) the average—545 c.c.
(*b*) the largest—814 c.c.
(*c*) the smallest—187 c.c.

The grand average of all the above figures is—**530** c.c.

Experiment 2.

Conclusions on the above experiment will always be fallacious unless the question of skin, one of the two most important portals of water elimination, is taken into consideration.

So in this experiment the relative humidity was determined for a period of one year. [*See Chart*—2] The mean reading of particular phases have been plotted for the total 12 lunar cycles in the year. [*See Fig*—I]

In this it is evident that the relative humidity is low on 3rd, 7th and 8th, 14th and 15th. So there is a likelihood of a greater elimination by skin on these days.

Experiment 3.

We know that two things at least in Nature have yet remained in its original state, being unable to be explored and exploited by man. One is the sea and the other the mountains. The phasial influence of the moon on tide is well known. So in this experiment I tried to study the way how the moon has effected the tide, in terms of the level in height of water in one of the local rivers (Rangoon).

Here there is a wonderful regularity in the influence, but highest and the lowest readings shift within a range of 4 places from months to months in the phasial cycle of the moon. This certainly gives us a true picture of Nature's influence. So it is only likely that the point of deficient water elimination by the kidney may shift within similar range in the case of man also as observed. [*See Chart*—3 *and Figs*—IV *and* VI].

Experiment 4.

In this group of experiments urea concentration tests (MacLean's method) were done in patients under identical conditions for a period of 2 months (15 grams of urea with 100 c.c. of water was given). In the 1st one month and a half, the total urine for two hours and the percentage of urea in the last ½ hour's sample were determined and the percentage of urea was determined in the samples ending in 2nd and 3rd hours respectively. During this latter determination the blood urea of the man was also calculated from sample taken 1½ hours after the administration of urea with water.

The urine elimination even in these experiments had same defective phenomenon as observed in the 1st experiment. *The percentage of urea varied inversely as the amount of water.* Low urea concentration is always associated with increased volume of urine. But on certain days even with low urine elimination, the urea concentration was low. These are the days that deserve explanations (1st 8th and 9th, 13th etc.).

Relation of urine urea and blood urea was defective on round about the 3rd, 8th, 14th and the 15th day. *(See chart* 4 *and* 5 *and Figs.* II, III, V *and* VII.*)*

[*To be continued*]

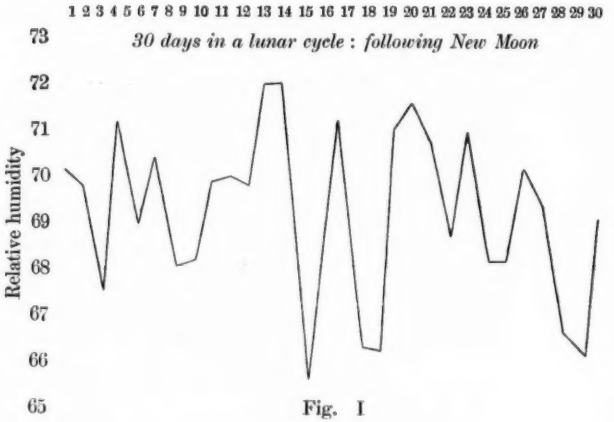

Fig. I

Mean Curve for a year

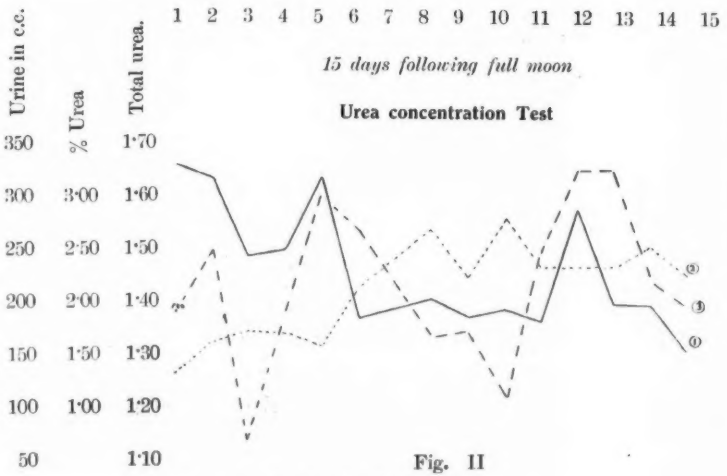

Fig. II

Curve (1) Total urine for 2 hours.
do (2) % urea in the 2nd hour's sample of urine.
do (3) Total urea excreted in the end hour.

from 25-3-29 to 10-4-29.

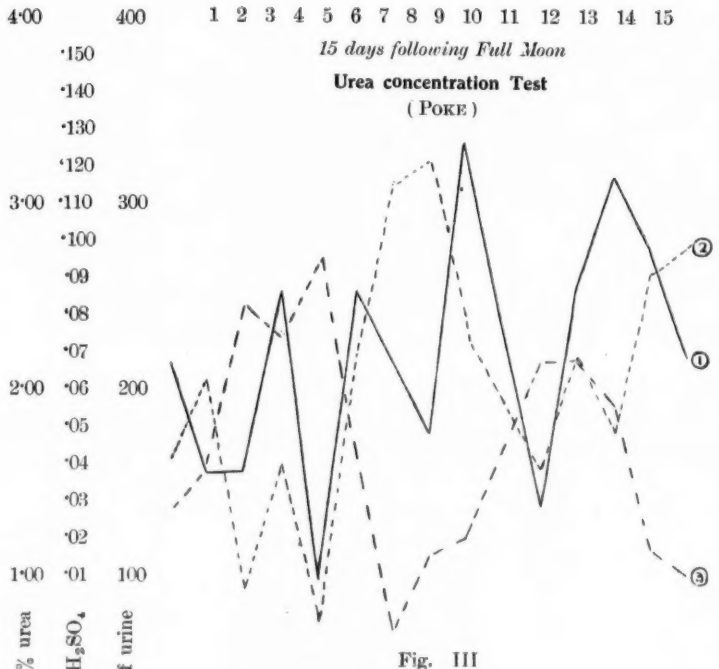

Fig. III

(2) 2 hours urine after urea
(1) Blood urea (expressed in terms of $N/_{10}H_2SO_4$ needed for titration)
(3) % of urea in the sample just after 2 hours.

24-5-29—7-6-29.

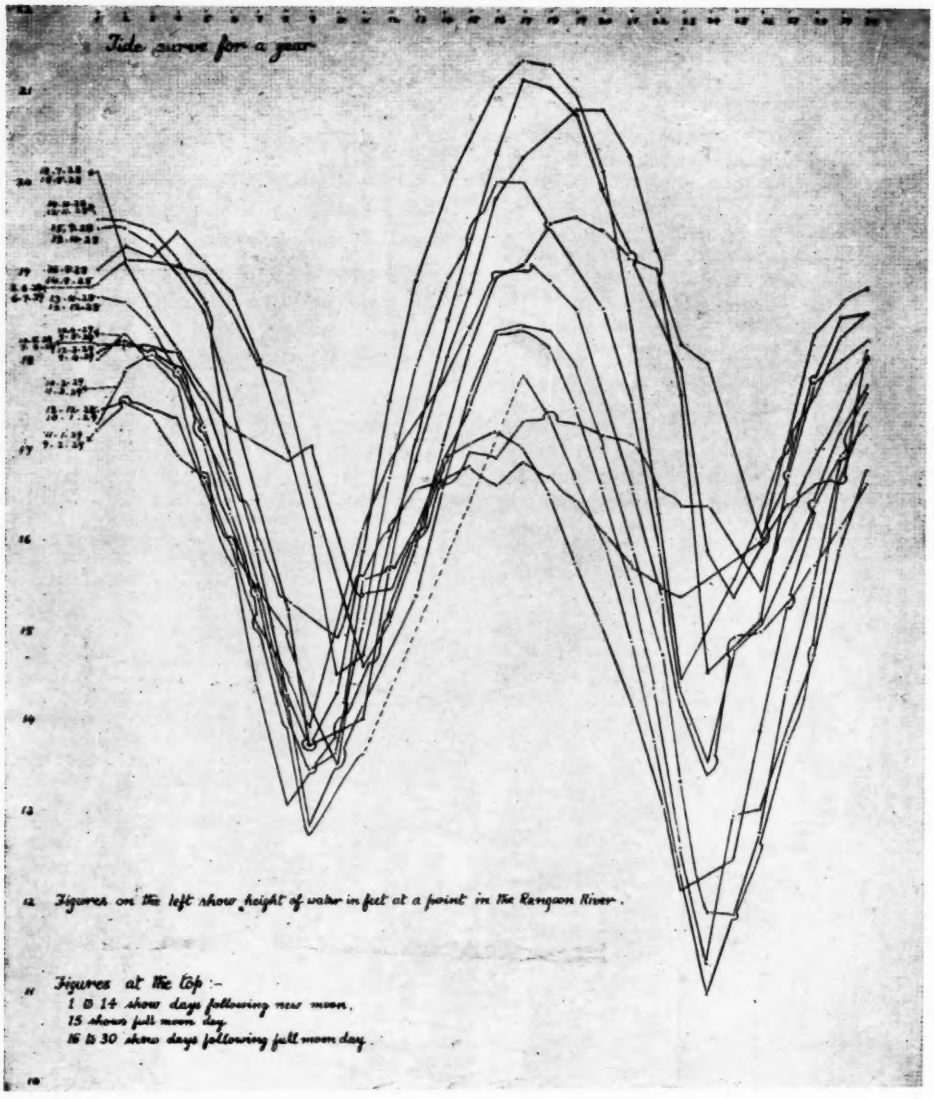
Tide curves for a year
Figures on the left show height of water in feet at a point in the Rangoon River.
Figures at the top :-
1 to 14 show days following new moon.
15 shows full moon day.
16 to 30 show days following full moon day.

Fig. IV
Height of water in the Rangoon River.

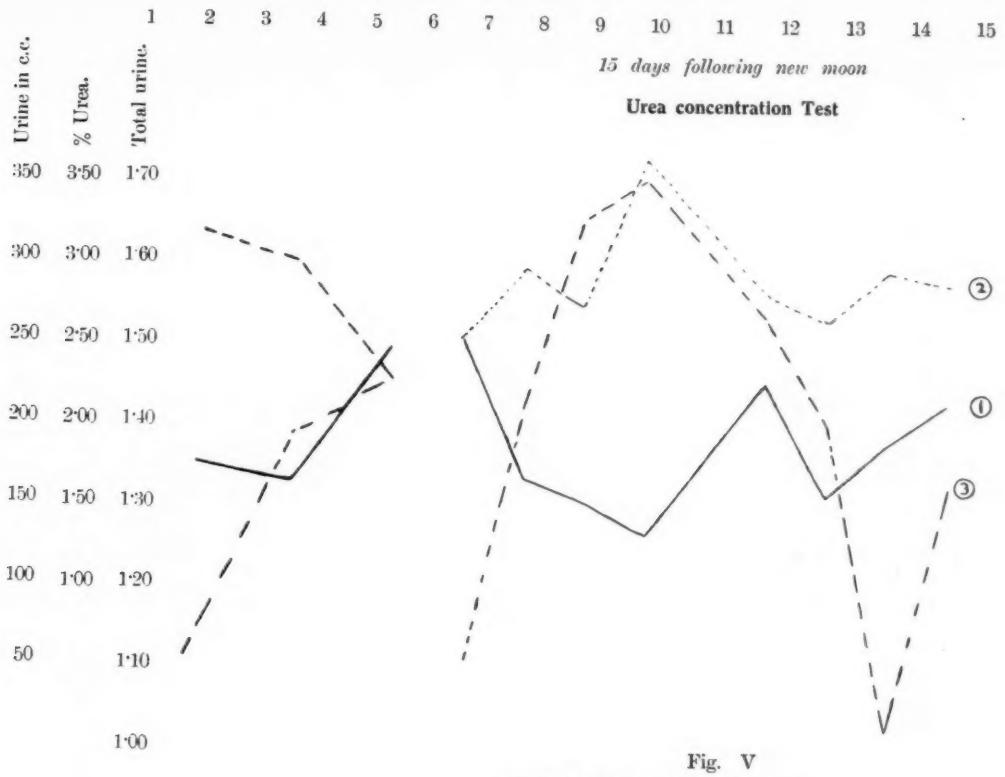

Fig. V

Curve (1) Total urine in 2 hours.
do (2) % urea in 2nd hour's sample of urine.
do (3) Total urea excreted in the end hour.

10-9-29 to 23-4-29.

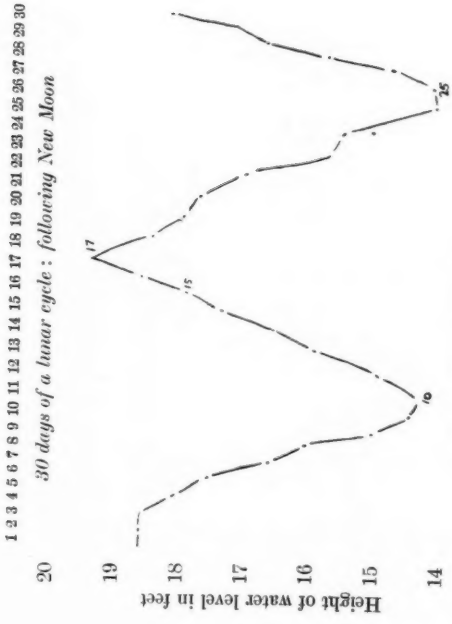

Fig. VI

Curve of Highest water level : Mean of a year.

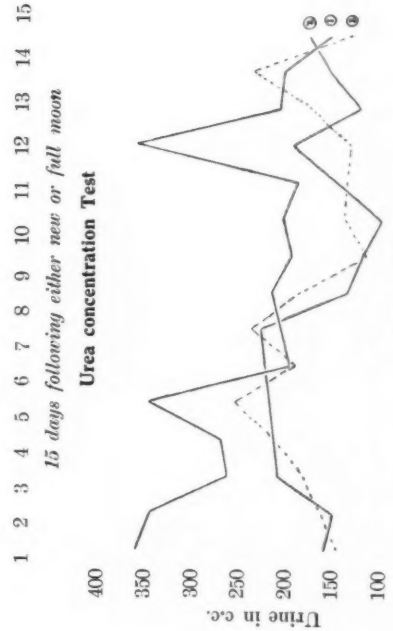
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
15 days following either new or full moon
Urea concentration Test
Urine in c.c.
400 350 300 250 200 150 100
①
②
③

Fig. VII

TOTAL URINE CURVE (2 hours)

Curve (1) 25-3-29—10-4-24 following full moon
do (2) 10-4-29—23-4-29 following new moon
do (9) 10-5-29—23-5-29 following new moon

CHART 1

2 Hours' urine in a fasting man after taking 500 c c. of water. **Poke.** *Male 22 Years.*

DATE. 666	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
24-12-30 to 18-1-31	515	650	500	315	475	550	460	500	470	650	650	530	475	...	275	430	...	625	825	675	675	620	450	300	680	675	700	500	750	600
19-1-31 to 17-2-31	500	450	550	485	675	520	575	615	475	700	550	615	400	500	500	500	625	710	677	400	550	500	650	700	700	600	600	550	500	500
18-2-31 to 19-3-31	700	750	675	700	850	875	675	725	500	600	700	725	750	475	600	675	650	650	625	600	600	500	500	500	750	650	575	500	675	500
4-9-29 to 2-10-29	400	620	425	450	450	220	510	490	475	500	675	300	250	525	500	500	560	400	450	575	500	500	460	425	510	500	500	510	—	500
3-10-29 to 18-10-29	450	500	450	480	500	505	480	460	500	570	560	460	560	475	560	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
MEAN	513	596	520	486	590	534	540	558	484	604	627	526	487	494	487	526	611	596	644	562	581	530	515	481	660	606	593	515	675	525
Pontya. *Male 27 Years.*																														
	1000	700	725	260	350	210	360	175	400	325	370	400	275	300	320	360	550	550	600	780	780	360	750	325	275	500	575	375	575	500
	675	575	625	550	800	...	300	375	600	600	600	550	500	475	375	365	500	560	575	560	450	450	550	550	325	650	550	500	450	500
	575	500	500	550	600	575	500	375	500	375	725	450	550	500	450	575	525	600	700	690	...	730	615	750	725	550	515	700	750	780
MEAN	746	591	616	453	583	392	386	308	500	433	565	466	441	425	381	433	525	570	625	676	615	513	638	541	475	566	546	525	591	593
Rambabu Singh *(Durwan).*																														
15-9-28 to 13-10-28	575	...	510	189	585	568	666	...	722	389	667	692	652	631	685	452	378	466	497	361	814	...	573	579	348	374	601	508	495	648
Dr. H. Chowdhury, *Male Age 36.*																														
16-8-28 to 14-9-28	416	436	413	328	491	402	466	456	584	553	516	589	496	516	439	509	449	...	388	421	502	443	479	475	474	405	334	517	560	455
14-9-28 to 13-10-28	563	551	418	441	520	628	490	580	364	438	473	565	487	553	443	329	360	302	347	370	524	...	389	518	444	445	472	419	538	437
13-10-28 to 12-11-28	361	258	464	393	502	439	558	535	493	639	628	319	524	555	...	493	557	514	474	624	494	571	393	584	413	662	495	441	435	498
12-11-28 to 12-12-28	413	512	470	560	516	571	533	453	581	491	437	509	474	612	609	437	566	577	...	578	546	558	521	441	516	544	564	610	600	487
12-12-28 to 10-1-29	601	361	453	517	372	392	412	553	480	569	527	502	...	664	494	554	476	420	459	504	612	547	442	528	496	638	449	563	499	522
10-1-29 to 9-2-29	510	633	530	503	677	631	...	437	430	440	387	...	419	549	460	412	412	503	409	587	570	532	597	395	515	581	507	545	423	588
9-2-29 to 16-3-29	...	557	499	483	379	483	605	465	433	553	654	...	452	551	509	...	632	482	575	562	420	726	611	482	670	603	595	360	465	378
MEAN	488	464	461	461	494	507	510	496	481	526	517	531	476	555	491	456	494	466	443	522	525	563	490	489	504	540	495	494	503	481
Poke, *Male 22 Years.*																														
6-8-29 to 3-9-29	350	390	...	525	700	450	425	640	380	525	430	425	325	315	575	625	680	560	625	325	760	650	590	750	...	570	450	450	465	330

CHART No. 2

Relative Humidity in Rangoon in the various Phases of the Moon

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
January	95	91	83	85	84	86	83	84	88	89	87	86	89	85	83	92	83	83	82	86	84	85	88	78	83	87	87	85	...	90
February	90	86	88	87	82	92	89	85	89	85	86	88	91	85	78	92	85	...	92	84	88	83	77	78	87	87	85	86	91	81
March	85	80	86	90	89	91	83	91	91	82	76	86	83	87	36	82	79	86	79	89	85	...	86	84	82	75	67	64	68	71
April	70	71	72	72	70	67	56	57	59	61	67	65	66	68	...	74	76	74	74	77	77	79	79	75	69	63	66	66	71	67
May	66	66	64	69	70	66	67	67	72	70	68	65	63	60	56	57	54	57	...	59	59	58	60	55	59	60	59	58	57	56
June	54	44	45	52	51	52	57	51	55	58	56	60	...	58	58	61	58	59	60	52	60	58	71	62	56	63	55	54	54	52
July	50	43	45	51	58	53	...	54	52	46	43	49	56	43	44	44	44	36	49	50	60	66	60	53	55	59	51	47	44	55
August	53	52	45	43	34	32	43	48	47	55	54	...	58	59	56	65	63	44	46	45	40	38	42	60	59	59	62	53	60	50
September	58	72	67	70	54	...	58	57	60	66	71	64	55	58	64	63	58	60	61	71	66	60	61	52	56	56	58	60	67	64
October	66	60	64	60	63	60	65	55	60	63	...	66	63	62	57	57	57	63	56	64	61	64	55	53	60	59	58	62	59	70
November	64	82	...	89	91	91	80	82	84	86	74	82	79	93	86	81	71	78	87	88	86	83	85	82	...	85	85	83	88	87
December	93	92	85	88	82	86	...	88	81	80	85	91	90	88	86	87	87	88	91	94	82	80	86	84	82	88	88	79	...	83
MEAN	70·3	69·9	67·6	71·3	69·0	70·5	68·1	68·2	69·9	70·0	69·8	72·0	72·0	65·5	68·5	71·2	66·2	66·1	70·9	71·5	70·6	68·5	70·9	68·0	68·0	70·0	69·2	66·4	65·9	68·9

CHART No. 3—(1st half)

Level of Height in Rangoon River.

30 days following New Moon Days. July 17th, 1928 to 6th July 1929.

Months.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
January ...	20′2″	19′3″	19′2½″	19′½″	11′11½	18′7″	17′11″	17′8″	16′7½″	...	14′7″	15′2″	15′10½″	17′1″	18′3″
February ...	19′0″	19′4½″	19′3″	19′5″	19′2″	18′9½″	17′11½″	16′11″	16′2½″	14′6″	14′8½″	16′½″	16′10½″	18′½″	18′9″
March ...	19′5½″	19′5½″	19′3½″	18′11½″	18′6½″	17′7″	16′5″	15′3½″	13′9½″	...	14′0″	15′8½″	17′1½″	18′5½″	19′4″
April ...	19′7″	19′6½″	19′5½″	19′2″	18′7½″	16′10½″	15′10″	14′3½″	13′9½″	14′3½″	15′10½″	17′6½″	18′10½″	20′1½″	...
May ...	18′8″	18′7″	18′4″	17′10½″	17′3″	16′3½″	15′4½″	14′½″	13′5½″	13′8″	15′1½″	16′8½″	17′11½″	18′10½″	19′4″
June ...	17′5″	17′6½″	17′4″	16′11″	16′8½″	15′11″	15′2″	14′5½″	13′10½″	...	16′1″	16′9½″	...	17′9½″	18′3½″
July ...	17′3½″	17′6½″	17′5″	17′4½″	16′3½″	16′½″	...	14′11½″	14′2½″	13′6″	15′6½″	15′7½″	16′2″	16′10″	17′5″
August ...	17′3½″	17′10½″	18′1½″	17′10½″	17′3″	15′7″	15′6″	14′2½″	12′9½″	...	14′2½″	...	15′4″	16′7″	17′7″
September ...	18′2″	18′3½″	18′1″	17′10½″	17′1″	...	15′5½″	13′11″	12′9½″	...	13′7½″	...	...	...	...
October ...	18′0″	18′3½″	18′½″	17′8″	16′8½″	15′8½″	14′4″	13′½″	...	13′9″	...	15′2½″	16′2″	16′10½″	17′½″
November ...	18′2″	18′2½″	...	18′1½″	17′7″	16′9″	16′0″	15′3½″	...	14′11½″	15′7½″	16′½″	16′7″	16′7½″	16′9½″
December ...	18′9½″	19′2½″	18′7½″	18′2½″	17′8″	17′3″	...	16′11″	17′½″	...	15′5″	15′5½″	16′2″	16′7½″	16′11″
MEAN ...	18′½″	18′½″	18′½″	18′	17′½″	16′6″	16′	15′	14′4″	14′3″	15′	16′	16′7″	17′5½″	18′0″

CHART No. 3—(2nd half)

Months.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
January ...	18'10½"	19'½"	19'6"	19'1½"	19'5"	19'3"	19'0"	18'4"	17'11"	...	16'0"	16'8½"	17'9"	...	18'3½"
February ...	19'9½"	20'4"	...	20'8½"	20'8½"	20'4½"	19'3½"	17'7½"	14'6"	...	15'1½"	16'9"	17'9"	18'5½"	18'11½"
March ...	20'3"	21'1"	21'0"	20'8½"	19'10"	19'2"	...	17'10½"	15'10"	15'4"	15'10½"	17'1"	18'3"	19'2"	19'3½"
April ...	21'0"	21'3½"	21'3"	25'10"	20'1½"	18'6½"	16'3"	14'5"	...	15'6½"	16'3"	17'½"	17'8"	18'3½"	18'6"
May ...	19'11½"	19'11½"	19'5½"	...	18'7"	17'6"	15'10"	14'4½"	13'6"	14'9"	15'1"	15'8½"	16'4½"	16'11"	17'3"
June ...	18'11"	19'1"	18'10"	18'6½"	..	16'7"	15'4"	14'2½"	13'4"	14'10½"	14'11½"	15'3"	15'8½"	16'2"	16'7½"
July ...	18'3"	18'4"	18'2½"	17'5½"	16'6½"	15'6"	14'4"	12'6½"	11'3"	12'11"	12'11½"	13'10½"	14'8½"	15'10"	16'9½"
August ...	11'3½"	18'4½"	18'3½"	17'10½"	17'0"	15'10"	14'8"	13'3"	11'9½"	11'9"	12'9"	14'3½"	15'6"	16'11"	17'7½"
September ...	...	17'9½"	17'4"	16'8"	15'10½"	14'10"	13'8½"	12'3½"	10'11½"	...	12'7½"	13'9"	15'3½"	16'8"	17'5½"
October ...	17'2½"	17'0"	16'6"	15'9"	15'½"	14'2"	19'7"	12'1½"	...	12'5½"	13'9½"	15'3"	16'5½"	17'2½"	17'8½"
November ...	16'8"	16'10"	16'8"	16'5"	16'½"	15'8½"	15'5½"	15'6"	...	...	15'11"	16'4½"	16'7"	17'2½"	18'2"
December ...	16'10½"	17'3½"	17'4"	17'3"	17'2½"	17'½"	16'6½"	16'4½"	16'4½"	...	15'5½"	16'3"	16'10"	...	18'2"
MEAN ...	18'7"	19'5"	18'5"	18'0"	17'8"	17'0"	15'7"	15'5"	14'0"	14'0"	14'6"	15'6"	16'5"	17'	18'

CHART 4

Urea concentration Test.

16 gms. of Urea in 100 c.c. of water taken at 7 a. m.

Days following Full Moon. **POKE**, *Age 22 Years.*

26-2-29 to 10-4-29	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Remarks
Total urea excreted in 2nd hour ..	1·38	1·52	1·12	1·39	1·63	1 56	...	1·34	1·35	1·21	1·51	1·68	1·68	1·45	1·40	
Volume of urine in 1st hour ...	244	239	189	179	23	118	...	160	130	155	121	231	133	145	91	
„ „ 2nd hour ...	103	93	64	80	102	71	...	48	59	42	63	70	70	56	61	
% of urea in 1st hour sample ...	·66	·56	1·02	·89	·70	1·4	...	·99	1·4	1·3	1·3	·92	1·1	1·2	1·2	
% „ 2nd „ ...	1·34	1·64	1·76	1·74	1·6	2·2	...	2·8	2·3	2·9	2·4	2·4	2·4	2·6	2·3	
Total urine in 2 hours ...	347	332	253	259	335	189	...	208	189	197	184	301	203	201	152	

Days following New Moon.

10-5-29 to23-4-29																
Total urea excreted in 2nd hour ...	1 15	1.33	1·38	...	...	...	1.04	1·35	1·58	1·63	...	1·46	1·33	0·91	1·25	
Volume of urine in 1st hour ...	105	86	127	...	...	...	172	80	50	48	...	131	62	108	124	
Volume in 2nd hour ...	48	58	74	...	...	...	48	52	67	50	...	60	59	44	51	
% of urea in 1st hour sample ...	1·3	1·5	1·12	...	...	...	·94	2·0	1·64	2·71	...	1·5	1·77	1·42	1·35	
% „ 2nd „ ...	2·4	2·3	1·87	...	...	...	2·18	2·6	2·36	3·37	...	2 44	2·27	2·57	2·49	
Total urine in 2 hours ...	153	144	201	...	...	...	220	132	117	98	...	191	121	152	175	

Days following New Moon.

10-5-29 to 23-5-29																
Volume of urine in 1st hour ...	77	119	119	158	166	122	159	88	59	92	64	...	117	140	60	
„ „ 2nd hour ...	63	56	56	47	81	62	70	91	54	44	66	...	53	92	68	
% of urea in 1st hour sample ...	·93	·32	·32	·66	·22	·87	·47	1·05	1·85	1·68	1·13	...	1·35	·47	1·25	Solar eclipse was
% „ 2nd „ ...	1 77	1·63	·63	1·49	·70	1·7	·99	1 56	2·52	2 26	1·78	...	2·42	·77	1 87	on 9-5-29.
Total urine in 2 hours ...	140	175	175	295	247	184	229	179	113	136	130	...	170	232	128	

CHART 5

16 gms. of Urea in 100 c.c. of water is taken nt 7 a. m. Blood drawn at 8·50 a. m.

Days following Full Moon. **POKE**, *Age 22 Years.*

24-5-29 to 7-6-29	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Remarks.
Volume of urine in 1st hour (A) ...	122	132	67	128	85	167	221	250	185	...	128	193	147	200	223	
Volume of urine in 2nd hour (B) ...	66	96	50	56	46	76	115	100	77	...	50	50	51	83	77	
Volume of urine in 3rd hour (C) ...	56	47	33	34	28	41	76	38	75	...	33	43	30	36	47	
% of urea in 2nd sample (B) ...	1·59	1·81	2·71	2·52	2·97	1·86	·93	1·35	1·45	...	2·39	2·41	2·15	1·35	1·23	
% „ 3rd „ (C) ...	2·32	2·35	3·03	3·27	3·25	2 26	1·36	1·64	1·76	...	2·83	2·30	2·76	2 56	1·64	
Total volume of urine in 3 hours ...	244	275	150	218	129	284	412	388	337	...	211	286	228	319	347	
% of urea in ·2 c.c. of blood expressed in terms of c.c. of N/10 Sulphuric Acid ...	·08	·05	·05	·10	·02	·10	·08	·06	·14	...	·04	·10	·13	·11	·08	

Observations on the Coagulation time of the blood of Guineapigs and Rabbits

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This work was undertaken as a sequence to our observations on the striking differences in the calcium content of rabbit's and guineapig's blood. Guineapig's or rabbit's blood used to be taken in the laboratory for the routine determination of calcium but, curiously enough, it was found that guineapig's blood contains, as a rule, more calcium than rabbit's blood. As soluble calcium is a determining factor in blood coagulation we thought that as guineapig's blood contains more calcium, it is quite likely that its coagulation time would be proportionately less than rabbit's.

In view of the above considerations, we estimated the calcium content of blood in a large number of rabbits and guineapigs and the results thereof are given in a tabular form in Table No. II. From these results it is obvious that guineapig's blood contains much more calcium than rabbit's blood. The average calcium content of guineapig's blood is 17.4 mg per cent and that of rabbit's blood is 13.6 mg per cent. In all these experiments calcium was estimated by the method of Krammer and Tisdell.

We next proceeded to determine the relative coagulation time of rabbit's and guineapig's blood, the results of which are given in Table I. It is clear from the above table that the average coagulation time of guineapig's blood is 1 minute and 26 seconds and that of rabbit's blood is 2 minutes and 25 seconds. The coagulation time was determined by a very simple method which is given below :—

The animals were given the same diet (grass and gram) and were kept under the same conditions during the course of the experiments. Two thoroughly cleansed and dried watch glasses of about 1½ inch diameter were taken. The veins of the ears of the animals were made prominent by removing the hairs by scissors and the ears were cleaned by ether. After a little while the vein was punctured with a needle. A tolerably large drop of blood was allowed to fall into one of the two glasses containing a lead shot and simultaneously a stop watch was set going. The watch glass was then covered by the second glass. The glasses were rocked gently till the movement of the shot ceased. The stop watch was stopped as soon as the shot ceased to move and the time taken for the blood to clot was noted. We repeated the experiment in the same subject keeping the condition the same as far as practicable.

To confirm whether the difference in coagulation time is really due to a difference in calcium content, we performed the following experiments :—

(A) A number of rabbits were taken and were injected intramuscularly with different amounts of calcium chloride (0·5 per cent solution). The coagulation time of the blood of these animals was determined after the injection at the following intervals :—

(*a*)	After	5	minutes
(*b*)	,,	30	,,
(*c*)	,,	60	,,
(*d*)	,,	90	,,
(*e*)	,,	120	,,
(*f*)	,,	150	,,
(*g*)	,,	180	,,

The results are given in Table III. The lowest coagulation time was found to be from 60 to 120 minutes after the injection. These results in the table prove clearly that it is the calcium content of blood that determines its coagulation time.

(B) It has been established before that there is a relationship between the glucose content, and calcium content of blood and its coagulation time (SVEC—1930, PARTOS & SVEC—1927, 1928, COWAN AND WRIGHT—1931), in so much that

when the percentage of glucose in blood rises, there is a corresponding rise in calcium content and the coagulation time falls accordingly. We corroborated this in the following way :—

We took a set of normal rabbits and injected through the veins of the ears a measured amount of glucose after removing a definite amount of blood for control. The blood samples were removed 5, 30, 60, 90, 120, 150 and 180 minutes after the completion of the glucose injection. The coagulation time was similarly noted. The amounts of glucose injected were made to correspond to the weight of animals. The results are given in Table IV.

Discussion : It is thus evident from the above experiments that in whatever way the calcium content of blood is increased, either by injection of calcium chloride as given in Table III or by injection of glucose as given in Table IV, the coagulation time decreases. It is thus established that the calcium content of blood determines its coagulation time. The question as to how calcium increases in blood after glucose injection cannot be discussed at length at present. It is established that insulin causes an increase in calcium in blood. When glucose is injected there would naturally be an increase in the insulin content of blood, thereby producing an increase in calcium in blood. The increase in calcium in blood. may also be brought about indirectly through parathyroids, for it is known that parathyroids and pancreas co-operate with one another with regard to their effects on the various metabolic activities of the body.

Summary : (1) Guineapig's blood contains as a rule more calcium than rabbit's blood.

(2) The time of coagulation of guineapig's blood is, as a rule, shorter than that of rabbit's blood.

(3) If calcium chloride solution be injected to rabbits, thereby increasing its calcium content in blood, the coagulation time of rabbit's blood decreases and approaches that of guineapig's blood.

(4) If glucose be injected to rabbits, there is an increase in the calcium content of its blood and the coagulation time diminishes.

(5) It may, therefore, be concluded that the difference in coagulation time between guineapig's blood and rabbit's blood is due to the difference in calcium content.

BIBLIOGRAPHY.

(1) PARTOS, A. and F. SVEC. 1927(a). Deutsch. med. Wochenschr., liii. 1857.
1927(b). PFLUGER'S ARCH., ccxviii, 209.
1928. PFLUGER'S ARCH., ccxix, 481.
(2) SVEC, F. 1930. PFLUGER'S ARCH., ccxxiv, 62.
(3) DONALD W. COWAN AND HAROLD N. WRIGHT. 1931: The American Journal of Physiology. Vol. C—No. 1, 1932.

TABLE I

No.	Animal.	Weight.	Coagulation Time.	Coagulation Time.	Weight.	Animal.	No.
1.	Guineapig.	150 gm.	1 min. 25 sec.	2 min. 50 sec.	1790 gm.	Rabbit.	1.
2.	„	170 „	1 „ 25 „	2 „ 10 „	1610 „	„	2.
3.	„	210 „	1 „ 30 „	2 „ 52 „	1600 „	„	3.
4.	„	410 „	1 „ 20 „	2 „ 26 „	1500 „	„	4.
5.	„	720 „	1 „ 31 „	2 „ 45 „	1440 „	„	5.
6.	„	770 „	1 „ 5 „	2 „ 45 „	990 „	„	6.
7.	„	110 „	1 „ 40 „	2 „ 5 „	920 „	„	7.
8.	„	820 „	1 „ 8 „	2 „ 6 „	820 „	„	8.
9.	„	830 „	1 „ 40 „	2 min.	880 „	„	9.
10.	„	190 „	1 „ 40 „	2 min. 45 „	990 „	„	10.
	Average coagulation time of blood.		1 „ 26 „	2 „ 25 „			

TABLE II

No.	Weight.	Animal.	Calcium.	Calcium.	Animal.	Weight.	No.
1.	260 gm.	Rabbit.	8·3 mg.	14 mg.	Guineapig.	110 gm.	1.
2.	265 „	„	8·3 „	14 „	„	110 „	2.
3.	300 „	„	10·7 „	20·8 „	„	305 „	3.
4.	345 „	„	17·5 „	10 „	„	320 „	4.
5.	625 „	„	15 „	17 „	„	350 „	5.
6.	630 „	„	12 „	17·7 „	„	430 „	6.
7.	840 „	„	17·1 „	19·1 „	„	470 „	7.
8.	1010 „	„	16.5 „	17·4 „	„	480 „	8.
9.	1040 „	„	15 „	13·7 „	„	422 „	9.
10.	1043 „	„	16·3 „	22·7 „	„	410 „	10.
	Average Calcium content.		13·6 „	17·4 „			

TABLE III

	Animal.	Weight.	Dose of Calcium Chloride.	Coagulation time of Blood.		per cent decrease.
				Initial.	Lowest	
1.	Rabbit	1560 gm.	2 c.c. of 0·5% $CaCl_2$	2 min. 30 sec.	1 min. 10 sec.	52·2
2.	„	530 „	1 „ „ „	2 „ 44 „	1 „ 50 „	60·0
3.	„	490 „	1 „ „ „	2 „ 10 „	1 „ 19 „	39·2
4.	„	630 „	1 „ „ „	2 „ 3 „	1 „ 17 „	37·3
5.	„	990 „	1 „ „ „	2 „ 31 „	1 „ 19 „	47·2
6.	„	860 „	1 „ „ „	2 „ 5 „	1 „ 25 „	32·0
7.	„	1560 „	1·5„ „ „	2 „ 50 „	1 „ 30 „	47·0
8.	„	460 „	·5„ „ „	2 „ 0 „	1 „ 6 „	45·0

TABLE IV

Weight of Rabbit.	Dose of Glucose.	Coagulation time			Blood Calcium		
		Initial.	Lowest.	per cent decrease.	Initial.	Highest.	per cent increase.
(1) 1560 gm.	1·5 C.C. 50% Glucose	2 m. 50 sec.	1 m. 30 sec.	47	10 mg.	12·7 mg.	27·
(2) 1000 „	1 „ „ „	2 „ 30 „	1 „ 25 „	43	13 „	16·6 „	27·6
(3) 900 „	0·6 „ „ „	2 „ 30 „	1 „ 15 „	50	16·3 „	21·3 „	30·7
(4) 1540 „	1·5 „ „ „	2 „ 10 „	1 „ 45 „	19	10·7 „	16·5 „	54·
(5) 1500 „	1·5 „ „ „	2 „ 40 „	2 „ 0 „	25	15 „	17 „	13·3
(6) 980 „	0·9 „ „ „	2 „ 10 „	1 „ 35 „	26·9	12 „	16·6 „	38·3
(7) 940 „	0·9 „ „ „	2 „ 10 „	1 „ 10 „	46	14 „	19·2 „	51·4
(8) 1400 „	1·4 „ „ „	2 „ 30 „	1 „ 50 „	26·6	8·3 „	8·6 „	3·8

Refraction

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Practically everyone in these days suffers from some form of refractive error. Yet we are told that for these ills, which are not only so inconvenient, but often so distressing and dangerous that there is not only no cure but also no other palliative save those optic crutches known as eye glasses. For the prevailing method of treatment, by means of compensating lenses, very little was ever claimed except that these contrivances neutralised the effects of the various conditions for which they were prescribed, as a crutch enables a lame man to walk. According to the usual training I used to prescribe glasses, for sometime in the past, with a view to prevent and cure imperfect eye-sight but since I had studied BATES' book on "Perfect Sight without Glasses" I am fully convinced that it is possible to attain perfect sight without the aid of glasses. The reason of this difference in the two methods is due to the difference in the theories of accommodation. Though the younger men of to-day are not encouraged to work in this field, yet the little experience which I obtained during a short period of five years compels me to put before you some facts about refraction, which I hope you will experiment at least and then form your own opinion leaving aside any prejudiced ideas. The following data are the accepted theories of the eye-specialists which, in my opinion, are not true. I shall deal with them separately.

1. That the lens of the eye under the control of ciliary muscle regulates the vision by changing its convexity according to the distance of the object from the eye; and the removal of the lens abolishes the power of accommodation.

2. That errors of refraction are due to permanent defects of the eyeball.

3. That the use of the eyes at a near point promotes the increase of myopia while use of the eyes at distant objects lessens the same.

4. That excessive light is injurious to the eyes, hence dark glasses and other protections are beneficial.

5. That due to permanent defects of the eyeball glasses are considered to be the only treatment to make the vision good.

This theory of accommodation had been proved by the images of Purkinje. LANGENBECK examined these images with the naked eye and reached the conclusion that during accommodation the middle image, coming from the front of the lens, became smaller than that when the eye was at rest. Since an image reflected from convex surface is diminished in proportion to the convexity of that surface he concluded that the front of the lens became more convex when the eye adjusted itself for near vision- Later the same theory was supported by HELMHOLTZ. Since then the pupils of HELMHOLTZ. are thoroughly convinced that the lens is the only factor in accommodation. Observations of HELMHOLTZ regarding the behaviour of the lens in accommodation, published about the middle of the last century were soon accepted as facts, and have ever since been stated as such in every text book dealing with the subject.

BATES of New York, in the present century, repeated the experiments of HELMHOLTZ on accommodation. After some years of hard work he was able to obtain photographs of images reflected from the front part of the lens both before and after accommodation. The images were clear and distinct, and moreover he arranged an apparatus by which an observer could see a clear image reflected from the cornea, iris, front part of the lens, and the front part of the sclera. There was no change in the image reflected from the front part of the lens during accommodation at different distances. All his experiments in detail will be found in the "Bulletin of the New York Zoological Society, November, 1914" and also in his book "Perfect Sight without Glasses".

The experiment for the production of the corneal image is one which almost everyone can repeat, the only apparatus required being an ordinary electric globe and a concave mirror fastened to a rod which moves in a groove, so that the distance of the mirror can be altered at will. The mirror should be so arranged that it reflects the image of the electric filament on the cornea. The light can be placed within an inch or two of the eye, as the heat is not intense enough to

interfere with the experiment. The closer it is, the larger the image. If the left eye is used by the subject, the source of the light should be placed to the left of that eye and as much as possible to the front of it at an angle of about forty-five degrees. As far as possible the light and the head of the subject should be held immovable. When the eye of the subject looks at a distant object the image from the cornea is smaller than when the eye is at rest. It indicates elongation of the eyeball and a consequent increase in the convexity of the cornea. When the effort is made to see at the near point, the image becomes smaller. It indicates flattening of the eyeball and a consequent decrease in the convexity of the cornea.

Thus BATES demonstrated, on the eye muscles of the rabbits, cats and other animals, the truth about accommodation.

The function of the muscles on the outside of the eyeball, apart from that of turning the globe in its socket, has been a matter of much dispute ; but after the supposed demonstration by HELMHOLTZ that accommodation depends upon a change in the curvature of the lens, the possibility of their being concerned in the adjustment of the eye for vision at different distances or in the production of errors of refraction, was dismissed and not given serious consideration.

"Before, physiologists were acquainted with the change in the dioptic system," says DONDERS, "they often attached importance to the external muscles in the production of accommodation."

THE REFRACTIVE SYSTEM

Experiments performed by Bates

1. A string was fastened to the insertion of the superior oblique and rectus muscles.
   (*a*) Backward pull produced myopia
   (*b*) Forward pull produced hypermetropia.
   (*c*) Upward pull in the plane of iris produced mixed astigmatism.
2. If one or both of the obliques were cut across, accommodation could never be produced, by electric stimulation of the eyeball, but after the divided muscles were sewn together, accommodation followed electric stimulation.
3. If one or both obliques were cut and two or more recti were present and active, electric stimulation of the eyeball produced hypermetropia.
4. Cutting the recti prevented production of hypermetropia but after the divided muscles were sewn together, hypermetropia was produced as usual.
5. Experiments performed on the lensless eye also showed the same results.
6. In the textbooks on physiology of the eye, it is stated that accommodation is controlled by the 3rd nerve but experiments show that third and fourth nerves are equally important in accommodation.
   (*a*) When either nerve is stimulated at the point of origin in the brain, accommodation is always produced in the normal eye. When the origin is covered with a small pad of cotton soaked in 2% atropin solution, stimulation of that nerve produces no accommodation, while stimulation of the unparalysed nerve produces it.
   (*b*) When the action of the oblique muscles is prevented by dividing them, stimulation of 3rd nerve produces no accommodation but hypermetropia.

These experiments are perfectly clear and conclusively prove that neither the lens nor any muscle inside the eyeball has anything to do with accommodation, but that the process, whereby the eye adjusts itself for vision at different distances, is entirely controlled by the action of the muscles on the outside of the globe.

The theory that errors of refraction are due to permanent defects of the eyeball lead naturally to the conclusion that errors of refraction are permanent states, and that normal refraction is a continuous condition. As this theory is universally accepted as a fact, it is not surprising to find that the normal eye is generally regarded as a perfect machine which is always in good working order. No matter whether the object regarded is strange or familiar, whether surroundings are pleasant or disagreeable, even under nerve strain or physical diseases, the normal eye is expected to have normal refraction and normal sight all the time. It is true that the facts do not harmonize with this view, but they are conveniently attributed to the perversity of the ciliary muscles.

Refraction of babies continually changes. One child examined under 3% atropine solution

by BATES on four successive days, beginning two hours after birth, gave the following results.

First day	...	Mixed astigmatism.
Second day	...	Comp. Hypermetropia and astigmatism.
Third day	...	„ Myopia and astigmatism.
Fourth day	...	One eye normal and the other simple myopic.

What is true of children is equally true of adults of all ages. During sleep the refractive condition is rarely normal. Persons whose refraction is normal when they are awake, will produce myopia, hypermetropia and astigmatism when they are asleep or if they have errors of refraction when they are awake, they will be increased during sleep. That is why people wake in the morning with eyes more tired than at any other time.

When the eye regards an unfamiliar object, an error of refraction is always produced. Hence the proverbial fatigue caused by viewing pictures or other objects in a museum. Noise is also a frequent cause of defective vision in the normal eye. All persons see imperfectly when they hear unexpected loud noise. Under conditions of mental or physical discomfort, such as pain, anger, anxiety, fever, depression etc., errors of refraction are always produced in the normal eye or increased in the eye in which they already exist.

When one patient is examined by several doctors the prescriptions of glasses for the same patient generally differ. In certain cases they differ so much that some prescribe minus glasses while others plus glasses for the same patient. These facts perfectly prove that refraction of the eye is never permanent. It is always changing. Hence the change is simply functional.

It is a popular belief that the habitual use of the eyes, for reading, sewing or for any other near work promotes the increase of myopia. It is not true that myopia is caused by too much use of the eyes at a near point. On the contrary near use of the eyes lessens myopia. This fact has been demonstrated frequently by BATES with the aid of retinoscopy while the eyes were being used too closely for long periods on near objects.

Another theory that individuals who use their eyes repeatedly for distant vision suffer less from myopia, has also been disproved by simultaneous retinoscopy. A strain to see at the distance always produces myopia. Look at a Snellen test card at twenty feet and read as well as you can. Now strain or make an effort to see it better and note that instead of becoming better it becomes worse.

A strain to see at near point does not increase near-sightedness, but always lessens it. Look at a card of fine print at six inches from your eyes and read as well as you can. Now make an effort to see it better, and note that your vision for the near point is lowered while the ability to read the fine print at a greater distance is improved.

Excessive light is not injurious but actually beneficial. On the contrary protection of eyes with eye shades or dark glasses is excessively injurious to the eyes. Patients who protect their eyes from bright light suffer more from eye troubles. Pure sun-light is necessary for the health of the normal eye. According to Hindu philosophy the sun is regarded as the god of the eyes. It is really surprising how much the vision may be improved by sunlight. Just try on yourself or on any patient who is suffering from any sort of eye trouble or defective vision.

Sit in the sun with eyes closed for 15 to 30 minutes and at the same time slowly move the head from side to side in order to avoid discomfort from the heat.

Due to permanent defects of the eyeball glasses are considered to be the only treatment to improve the imperfect vision. It has been already proved that the shape of the eyeball is changing continuously. Some times the eyes are focussed for distance and at other times for near vision. Glasses which correct the sight for reading very seldom enable the patient to see at distance. On the other hand, near-sighted persons whose vision is poor for distance, when wearing glasses to enable them to see distant

objects, find it impossible to read with maximum vision. When the glasses do not correct the vision for all distances, the eyes strain and try to overcome the bad effect of the glasses.

Glasses for the correction of far-sightedness may and usually give the reader the impression that the objects look larger than they really are ; while near-sighted persons wearing glasses are impressed with the fact that the objects look smaller than they actually are. In wearing glasses it is necessary to look directly through the centre of the glasses in order to obtain maximum vision. If one regards an object by looking in a slanting direction through the glasses, its form and location are changed.

The discomfort of the glasses is very great with a large percentage of people who wear them. Frequently when they complain to their ophthalmologists or to the opticians who supplied glasses, they are advised that by perseverance their eyes will become adapted to the glasses. This does not seem to be quite satisfactory because people feel that the glasses should fit their eyes, and not that they should fit their eyes to the glasses.

Glasses are injurious to the eyes. Once people begin to wear glasses, their strength, in most cases, has to be steadily increased to maintain the same vision as secured by the aid of the first pair. Glasses are very expensive for patients. Due to very expensive treatment many persons cannot have them. These facts clearly show that one should not prescribe glasses to the patients in the interest of humanity when they can be cured by other means. BATES describes in his books how errors of refraction are curable without glasses simply by eye education.

The fact that I got very good results in curing cases of amblyopia, hypermetropia, astigmatism, presbyopia etc. without the aid of glasses, caused me to have so much faith in BATES' principles and methods. *

* Paper read at the Scientific Section of the IX All-India Medical Conference, held at Lucknow, Dec. 1932

Social and Economic Factors in the Causation of Disease

K. P. MUKHERJI, M.B.

In going through the history of the development of medicine to its present standard, one can not but be struck by the fact that more stress is being placed on preventing than on curing of diseases. To any serious thinker the importance of preventing a disease is evident. Firstly, a disease when it occurs must have its toll of death however small in numer that may be. In the cases where no loss of life takes place, strength, vitality and working capacity are certainly lost for the time being at least. And, as a society is composed of individuals, the loss of individual strength, vitality and working capacity is a loss to the society as well. It can be easily understood that if diseases could be prevented society would be richer in life, strength, vitality and working capacity.

Until a few years ago the practice of medicine was confined to treating and healing the sick. It was employed to help the individual and did not take into consideration the relation of the disease to the community or of the community to disease. The consideration of the communal health as related to the individual health first originated in Italy during the *Renaissance* and was known as "Public Medicine." This consciousness towards the health of the community was confined at the time to a few diseases which were at that time known to be infectious and contagious, and measures of prevention such as *quarantine*, *isolation* etc. were introduced. This may be said to be the origin of the modern system of public health administration. Originating in Italy it gradually spread to the rest of Europe. At that time the knowledge of the nature and of the causation of disease were very crude. It was not until the

great discoveries of Pasteur and his contemporaries that a thorough reconstruction and reconsideration of the theories regarding the nature and the cause of diseases took place, and the bacteriologists' views as to them came to be accepted. So much so that the authors towards the latter decades of the last century, came to make statements as to the etiology of diseases in their works, which though judged from the present day standard of knowledge seems to be mostly wrong, yet were quite an advancement at the time. Many authors at the time stated that the Tubercle bacilli ware the cause of Tuberculosis. or that the Pneumococcus was the cause of Pneumonia. This condition of attributing the cause of a disease to the causative organism persisted more or less till very recently, when one began to hear mild protests at the unwarranted use of the word "the cause."

In an interesting essay published a few years ago, VON HAUSMANN points out that it is extremely rare to have relations so simple as that any particular organism can be regarded as the cause of any given disease. Invariably it is but one of the causes, an essential one no doubt, nevertheless one of several. For persons interested in the health of the community the distinction is of very great importance, and must not be lost sight of.

Taking the example of the pulmonary tuberculosis almost all the older text books speak of this as being caused by the tubercle bacilli. That T. B. plays a very important part is admitted beyond doubt ; but we also find that practically all adult human bodies, especially of the city dwellers, show evidence of T. B. infection at autopsy yet they were never clinically tuberculous. Again, at some time or other most of us are exposed to the inhalation or ingestion of T. B. yet few of us get the disease. In the face of these facts it can not be logically stated that tubercular infection is synonymous with tubercular disease of the body. One may say that the other complimentary factor for the causation of the disease, is the body resistance.

Among the causative factors which most authors either ignore or pass over very lightly, there are none of greater importance, from the communal health point of view, than those dealing with the social and economical conditions pertaining to disease. This point has been clearly presented by GROTJAHN who speaks of a "Social Pathology" of disease.

In the oftquoted report of the United States Children's Bureau regarding infant mortality one finds tables showing that the mortality varies with the family income. The lower the income the greater the mortality and *vice versa*. Careful consideration of the tuberculosis statistics in recent years has brought out the fact that the frequency of the disease varies directly with the number of persons per room in the community.

That there is a very important social factor is evidenced by the fact that infant mortality is very high among the illegitimate children. GROTJAHN classifies the ways in which the social and economical factors are causally related to disease as follows.

The social and economic factors or conditions—

1. Creating or favouring the disposition to disease.

2. Those bringing with them the conditions necessary for the disease to develop.

3. Those constituting the means of transmissions of the disease.

4. Those influencing the course of the disease.

There is another thing, probably of equal value and importance to the community, *viz.* the influence exerted by the disease on the community's social and economical structure. From this stand point the significance of disease depends primarily on its prevalence. It does not matter how dangerous a given disease may be to the individual, its significance to the community is slight if the disease is not frequently met with.

Besides the actual prevalence of disease, society is much concerned with the age of the persons chiefly affected. Taking for example three diseases equally prevalent but one attacking chiefly infants, the second attacking mainly adults and middle aged persons and the third only the older population, it is evident, which of

these three is of the most importance from the social stand point.

The results and sequelae of disease are also of importance to the community. The outcome of a disease are also of importance to the community. The outcome of a disease may be enumerated as follows.

1. Total recovery, 2. Death, 3. Physically handicapped, 4. Chronic invalidation, 5. Predisposition to other diseases and lastly, 6. Transmissible impairment.

Considering the numerous interrelations between disease on the one hand and social and economic conditions on the other, one is bound to come to the conclusion that a more careful study of these relations will certainly help to reduce the prevalence of many diseases which till now have baffled our efforts. Our failures may have been due to treating the symptoms rather than the causes.

In order to have some idea of the nature of the studies made in the field of Social Pathology and especially to serve as a typical picture of the newer schools of thought, I tried to collect a few data relating to Tuberculosis and Infant mortality.

TUBERCULOSIS.

Tuberculosis has been well termed a disease of the masses. The fact that almost all human adults show evedences of tubercular infection at autopsy,, as stated before, indicates that some thing more than the mere presence of the organisms in the system is involved in the causation of the disease. As the importance of a disease from the community's stand point is directly proportional to its frequency, it may be pointed out that deaths from Tuberculosis exceeds that from any other disease singly in many communities. Moreover, the victims of tuberculosis are at the prime of their lives. This is shown below by the table of the age distribution of the deaths from Tuberculosis in the New York city in 1926.

Deaths from Tuberculosis in N. Y. city in 1926.	Males.	Females.
Under 15 years.	29·4	27·5
15 to 24 years.	96·0	121·9
25 to 44 ,,	132·1	87·9
45 yrs & over.	203·9	74·3

It is also to be noted that the males are affected more than females because of the larger number of males in the industrial employment than females. Of late years the number of deaths of females from tuberculosis are on the increase in England and Germany and other industrial countries on account of the increase of the female labour in industries.

It has long been admitted that the incidence of tuberculosis is closely related to occupation. It is most among the dusty prefessions *e.g.* stone cutters, grinders, compositors etc. The characters of the dust also appear to play rather an important part. Among the stone cutters, lime stones seem to have little or nothing in the way of being harmful, whereas flint and quartz dust are very harmful. Amongst the miners coal dust appears to be quite harmless as far as tuberculosis in concerned.

Amongst millers tuberculosis was rampant before, due to the stone dust from the rollers, but since the introduction of steel rollers the incidence of tuberculosis amongst them has come down remarkably.

Writers on tuberculosis often make reference to the relation between tuberculosis and bad housing condition. They point out the frequency with which tubercular patients are found in ill-ventilated and crowded rooms in mean and dark houses ; and this can not be disputed. Nevertheless it must not be forgotten that this in itself does not prove the causal relationship and even admitting the relationship it has to be considered to what proportion of cases the disease or the diseases are the cause and in what effect. Tuberculosis or any other prolonged illness makes such a drain on the family income in an already poor family that they have to shift from house to house and always to cheaper ones in order to save money for the prolonged treatment of one or any of its members. However there can be no question that improved housing constitutes one of the pressing needs in the campaign against tuberculosis. The number of rooms occupied by the family is of great importance as a seperate sleeping room for the patient must be provided for. It is not only in the

cities that the housing is bad, the overcrowed, damp and ill-ventilated farmers' cottages stand in the same relation as the city's slum houses

That the economic conditions of the family play a very important part in tuberculosis is also admitted. The better the economic condition the better the *'tuberculosis-health'* of the family in general as shown by the table compiled in Hamburg and reproduced below. This shows the deaths from tuberculosis per 100,000 population arranged according to taxable income.

Income in Marks	No. of persons	Death per 100,000
900 to 1200	71,526	482
1,200 „ 2,000	48,855	447
2,000 „ 3500	21,397	274
2,500 „ 5,000	8,342	252
Over „ 5,000	14,323	120

Here again enters the question of cause and effect as stated once before. Disease when prolonged causes a severe drain on the family income.

From the social stand point the important consideration is the fact that not only does tuberculosis cause a very large number of deaths but also causes a large amount of physical impairment and invalidism. What this amounts to in years may be gauged from the statistics of the German Sickness Insurance. In a certain nine years period, 161,409 men under 60 years were given pensions and this precocious invalidism had caused a loss of 1,842,413 years, an average of 11·4 years for each pensioner.

38	pensioners were only	20	yrs old, a loss of		1,280 yrs.
1097	„	21	„	„	36,062 yrs.
1910	„	30	„	„	48,602 yrs.

In dealing with the case of tubercular patients from the point of view of Social Pathology, it has to be insisted that the various measures to be taken by the community, be economically sound. Thus the caring for advanced indigent cases of the disease, *i.e*, the provision of expensive public hospitals, where the life of the patient may be prolonged as far as possible is considered to be economically unsound. On the other hand the attempt to provide remunerative occupations for patients from sanatoria is entirely in harmony with this principle. The excellent work done in Edinburgh by PHILIP shows what can be done in this direction.

INFANT MORTALITY.

The number of infants born, who fail to survive the first year of their life is very great. In this country where death registration specially that of the children, is done in a slipshod manner, it is extremely difficult to form an idea as to the real amount of loss of infant life. But in other countries where death registration is done in a proper manner, one can form a very clear idea regarding this and hence can also investigate the causes working at the root of this unhappy condition.

In the U. S. A. registration area in 1925 the infant mortality rate ranged from 51·1 per 1000 to 90·5. In Moscow and in Leningrad in 1923 the rates were 163 and 138 respectively. In Newzealand in 1924 the infant mortality rate was 40·2, in the same year in Ceylon it was 186·5, while in Chile 266 babies died for every 1,000 babies born, during the first year of their life. Whereas in England and Wales in the same year the mortality was only 75 per 1,000.

Examining the cause of this high mortality in certain countries one is impressed by the remarkable difference between the mortality of breast-fed infants and those brought up on the bottle. The table below shows it at a glance.

Infant Mortality.—According to type of feeding.

Age of Babies	No. of babies alive at each age	Breast-Fed only			Mixed-Fed			Artificial-Fed		
		Total	Death in the 1st year.		Total	Death in the 1st year.		Total	Death in the 1st year.	
			no :	Rate per 1000 at each age		no :	Rate per 1000 at each age		no :	Rate per 1000 at each age
End of 3 months	1355	987	46	46·6	175	10	57·1	193	32	168·8
End of 6 months	1313	616	18	29·2	447	10	22·4	250	12	72·0
End of 9 months	1282	220	3	13·6	709	8	11·3	353	4	11·3

From the table above the condition seems appalling at the first few months of life. The deaths of the artificially-fed are nearly four times that of the breast-fed.

The question now arises, why the mothers, in such a large number of cases, of these babies, do not feed their children at the breast. Are they physically unfit to do so, in so large a proportion of cases, or are there other reasons why they do not do so ? The answer to this may be found in the figures compiled by SCHWARZ, Director of the Pediatric Department of Hill's Maternity Clinic in New York. He found that of 1500 mothers only 4 were physiologically unfit to nurse their babies. All the rest could do so when encouraged by proper care at confinement and after. Of these 1500 mothers, 96 per cent, nursed their babies for one month, 89·1 per cent for three months and 77 per cent for six months only. Why is this falling off, in the number of nursing mothers ? In this connection it would be better to state that the infant mortality rates are usually higher in industrial centres than in the agricultural districts. More women being employed in industries, and the economic conditions of the industrial workers being very bad both the husband and wife have to work in order to keep a home and support the children. And moreover as the employment of women in industries is on the increase it is extremely important that cognizance should be taken of the relations here pointed out. In the following table, compiled at Johnstown, U. S. A., one would find the difference in the infant mortality rate in relation to the employment of mothers.

	Infants Breast-Fed						Infants Artificially-Fed	
	Wholely		Partially		Together		Infants	per cent
	Infants	per cent	Infants	per cent	Infants	per cent		
Mothers employed ...	155	22·86	94	13·86	249	35·73	429	63·27
Mothers not employed ...	3046	51·50	845	14·29	3891	65·78	2024	84·22

In the case of the artificially-fed infants there is another factor which requires mention. These infants are deprived of their normal food and are made to live on a different substance regarding the purity and suitability of which there is great doubt in all countries. Families which contribute most to the deaths, are as ignorant about child feeding as they are of the quality of the milk supply. Milk guaranteed to be pure always cost more than the ordinary milk and it is not always that a working man can afford to have enough pure milk for his baby at the price. Then there is the importance of keeping the milk cool and free from bacteria in this hot climate of ours. In the New York City Baby Clinics there is a charity of ice with pure milk supply in the summer months.

From a sociological stand point it is important to recognise the justice of the claims by a community to have a clean and safe milk supply. Milk supply is just as important as water supply to a community ; and when the latter can be controlled and made safe as it is done to-day in almost all countries, it would not be too much to ask and demand that the milk also should be rendered clean and safe in the same way by supervision and control. The community has a right to demand even more, the milk being the most essential of all foods the price of this should be controlled and brought within the reach of the poorest and that the supply should be free to the needy. Evidence in support of the importance of bringing down the price of milk may be found in the statement of the New York health authorities, that the increase in the price of milk in 1917 was accompanied by an increase in the infant mortality rate. In Europe the curtailment of the milk supply during the war

is said to have resulted in a large increase in the infant mortality rate.

From the sociological point of view there is an interesting point to note that there is a relation between Birth-rate and Infant-mortality-rate. In fact authorities consider that the alround decrease in the infant mortality rate is due more to a decline in the birth rate and fecundity rate than to any other factor. PFLUGGER states, and which is very true, that when many children are born, the nursing care given to the later born is less, the family income becomes insufficient and the mothers are not able or are not willing to nurse their later-born at the breast. When fewer children are born these considerations disappear more or less and a large proportion of children remain alive. This is borne out by the two following tables, one from Saxony the other from Johnstown survey 1911. In both the infant mortality rate is shown according to the order in which the children were born. Although the rates vary a great deal the agreement between the curve of the mortalities is remarkable.

Order of birth of Children.	Saxony Infant Mortality.	Johnstown survey. 1911 (U.S.A.) Infant Mortality.
First Children	229	143·6
Second ,,	204	131·2
Third ,,	212	144·2
Fourth ,,	232	142·0
Fifth ,,	263	178·1
Sixth ,,	289	175·5
Seventh ,,	311	192 1
Eighth ,,	332	165·4
Ninth ,,	361	228·2
Tenth ,,	413	252·3
Eleventh ,,	514	...
Twelvth ,,	597	...

Considerable influence is exerted by the character of the attendance during the period of carrying and at the time of confinement but in taking statistics one must take into account that a large number of difficult and abnormal cases are included in a physicians practice, which raises the death rate. The hospitals again carry a larger number of more difficult cases and hence allowance has to be made for the purpose of comparison between the death rates in physician's and hospital practice and that of a midwife.

The infant mortality rate is also influenced by the number of working class population in the community, the mortality rate amongst whom, being greater, tend to raise the general rate of the community. The causes at play may be enumerated as follows :—*Illegitimacy, syphilis, tuberculosis, alcoholism, overcrowding, gainful employment of mothers, low average wages, entrusted care of infants to irresponsible and careless neighbours, ignorance, superstition, extensive employment of quack remedies and patent medicines.*

As stated before, the illegitimate children render a higher death rate than their legitimate brothers. The causes are not far to seek. Many of the infants are abandoned and are picked up as foundlings some-times after severe exposure, while others are victims of baby farmers. Even when with their mothers, they do not get as much care and attention as they require. Artificial feeding is extremely common as the mother in most cases has to go to work for a living.

To a large extent many of the above social and economical factors depend on one main economic factor namely, the family income. How great a difference in infant mortality this can make is well shown by the table given below. It is a table of infant mortality compiled in Berlin according to family income as shown by their environments.

Infant mortality in well to do section of Berlin *e. g.* Friedrichstadt & Tiergarten ... 52·9

Infant mortality in the poorer section of Berlin. Wedding ... 420·0

Infant mortality in the whole city ... 196·0

The same type of result has been obtained by the JOHNSTOWN SURVEY of 1911, and by the Children's Bureau in Manchester N. H. in 1914. It is obvious that the size of the family income will determine the character of the family environment, thus, the character of the neighbourhood, the condition of the house, sewer connection or privy, quality of the milk supply, the necessity of the mother to work, etc.

From what has been said above it is clear there is no exaggeration in saying that in no other domain of communal medicine can more intimate relation be found between mortality and social and economic condition than what exists among the causative factors of infant mortality It is also clear that in no other case does one meet with better results for one's troubles than in the measures taken against infant mortality.

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Editorial Comments

Indian Institute For Medical Research

Elsewhere in this issue are published the details of a Scheme for the establishment of an Indian Institute for Medical Research. We do not know whether the 35 subjects which the promoters have in view can be fulfilled all at once, but there is no doubt that the establishment of such an institution has not come too soon. During the last half a century, enormous strides have been made in most of the advanced European countries and in America and national health now occupies an important place in the constructive programme of every country. Unfortunately, the progress has not kept pace with the needs of the people in India. It has given us pleasure to note that in recent years there has been a growing desire on the part of medical men, scientists and the public to improve the physical and mental fitness of the people to enable them to reach the world standard, if possible. That the speed in achieving this can be quickened by intensive study and research has been shown in Asia by the Japanese within recent memory. The existing Government institutes in India cannot adequately tackle the diverse problems regarding the health of a population of 350 millions. We, therefore, welcome the proposal, though in the matter of finance perhaps, the time is apparently not very opportune. We trust, however, that our people will realise the unique importance of the movement and contribute liberally and generously for its success.

Two of the objects of the Scheme have attracted our attention particularly,—First, the organisation of the Diagnostic Service—for the laboratory diagnosis of various pathological materials collected from suffering patients at a nominal charge. Even in big towns where these facilities exist, the poor people cannot afford to take the valuable aid of the laboratories for diagnosis and treatment. We shall look forward to the day when this institute will be able to extend its operations not only to provincial centres but also to district towns and other populous areas. Such an organisation will materially supplement the future constructive efforts of the Local Government as well as of the Local Bodies in the region of their activities. The second object is even more important, having regard to the present urgent needs of the country. Scientifically prepared and standardised organo-therapeutic preparations, fresh sera and vaccines are now not only important additions to our therapeutic armamentorium but are essential to the proper treatment of patients to bring about preventive as well as therapeutic immunisation.

At present, several research institutes, official and non-official, in India as well as abroad, are engaged in similar work but we have to remember that, on the one hand, their number in India is small compared to the needs of our whole population and, on the other hand, the price of the scientific products that has to be charged on business principles is almost prohibitive to the majority of the poor Indian sufferers. Though the proposed institute, for its own existence, must make an income out of the sale of the products among consumers capable of paying for them, yet we would expect it to make a start in the direction of supplying such therapeutic to poor sufferers at a very much reduced price on the recommendation of recognised members of the profession or of constituted hospitals, as far as possible. We feel that the main function of this section of the institute will be to help the introduction of scientific medical treatment among the masses in this manner.

Another duty of the institute shall be the standardisation of therapeutic agents. In the absence of a State control of such products, India is now being flooded with innumerable understrength and adulterated products of indigenous as well as foreign origin and the members of the profession are at a loss to know which of them conform to the proper standard. We are glad to note that the institute proposes to take up this important and onerous, though not always pleasant, duty.

The Institute has been located in Calcutta, but we expect that similar institutes will be established in various provincial and district towns with whom it may be the pleasure of this organisation to co-operate and act in unison.

We commend a perusal of the appeal issued by the promoters of the Scheme to all the members of our profession and request them to contribute their mite to assure success to it. We are sure the medical profession, if they pool their resources, can substantially accelerate its progress.

Medical News and Notes

[Items of news and notes of general interest to the profession for incorporation in this section from the members of the profession will be greatly appreciated—EDITOR]

Birth Control : the Reasons for Reform. MR. T. R. VENKATRAMA SASTRI, C.I.E, writes :—(Hindu 20th November, 1933).

It will be interesting and profitable to consider in detail with much illustration two rival attitudes in the matter of ethical teaching. For want of any better words, we may call the one conservative and the other liberal. "Take your stand on principle. Demand all you can. It may be demanding too much of human nature, but do not mind it. It is only so that you can get the best of human nature." This is one view. "To demand too much is to court inattention, neglect and a feeling that you do not want to be taken seriously. You must face the essential facts of life and prescribe possible and not impossible virtues if you wish to be listened to." This is another view. As in all other matters, life gets on on a mixed basis. Latter-day Hinduism, Catholicism and English life, secular and religious, prefer the conservative view. The ancient Hinduism and the Aryan ideal in general took account of life and its practical needs.

SEX AND RELIGION

Celibacy is a state of great sanctity and holiness. Its highly meritorious character is allowed by all forms of Hindusim, inclu ding Buddhism and Christianity and possibly other religions. It is said that Christianity primarily treats sex as sin and for that reason recognizes celibacy as a great virtue. I do not know how far it is correct representation of Christian Ethics. There is one train of thought common to Hinduism and Buddhism that it is a great merit to cast out all desire and the avoidance of sex has an exceptional merit in that it is the riddance of one of the irresistible desires of man. "Woman and gold tempt all men. Not to yield to the temptation of either is to be very God in human shape." There is another idea in the Sanskrit word for a confirmed natural celibate, *Urdhvaretas*, which means that he is one who has drawn upwards and inwards all sexual energy and never allows it to flow out of himself. It is sublimated sex energy that has built up all that is valuable within man and in the outer world of men. This is an old idea, possibly underlying even phallic cults, and not without parallel in modern thought. In order to be valuable, the celibacy must, however, be real, that is, *not merely physical but also mental.* Real celibacy is rare, and not all professing celibates show recognisable virtue. Some hold that celibacy may itself be harmful. The evils of even honest, but struggling, celibacy led very early to the conclusion (and recommendations were framed accordingly) that the state of a householder with a wife and family is as good as that of a spiritually celibate if his sex life is limited to the demands of procreation. One may well claim greater merit for such a householder. To abstain is easy. To allow the play of sex ideas and then to restrain it within the narrow limits of procreational demand is to require greater self-control. It is obviously a counsel of perfection incapable of attainment. Looking, as it does like a concession to sex desire, it might involve no more than one meeting between the husband and the wife for each of their children and a demand of such limit to sex life fails to recongnize that the true harmony of a householder's life requires a certain degree of support in physical relation which must be a vast deal more than what the demand concedes. To ignore it, to be unmindful of the duty of giving it that degree of support, is to ruin its foundation from the strict theory of procreational sex life to the sane and natural moderation of ordinary religious life is provided by the myth of God's concession to the human female of the right of sex life during pregnancy and the practical injunction to maintain a pregnant woman in a happy contented frame of mind in the interest of the future child. There was, even after these concessions to a saner view a lingering train of ancient thought that a perfect man abstains except when the duty of procreation or the duty of satisfying another's desire breaks upon the duty of abstention. There is something gratifying to male pride in the underlying assumption that the strong male has no sexual desire of his own but only makes a concession to the desire of the weak female. Any how, by a slow process of seemingly grudging concession to human weakness, we pass from fantastic theories to the normal life of moderation. The moderate life steers a middle course—neither demanding the impossible, nor failing to demand enough for securing a clean and healthy life.

Of sex energy then, there are three resulting uses, part sublimational and spiritual, part procreational, and part "recreational" if one may use that term for sex acts not intended to result in creation.

Where procreation may result but is not desired, what is one to do ? Those who hold that there should be no such case should be

invited to study and advise on the following cases.

There have been cases within my knowledge in which the husband was told that another pregnancy would mean death. Another pregnancy did happen resulting in death. Would *contraception* have been proper in that case? Or should the husband be required to refrain or the wife be advised to deny herself?

A large family does frequently, if not always, involve the death of some children. If one had twelve children born and five of them died, the effective addition being only seven, would it have been right to have spaced the children in such a way as to have produced only seven children with the very probable consequence that the seven would have been better brought up and stronger and the mother herself more healthy and able to attend to the children and the family generally. Would the practice of contraception for the achievement of that result be permissible? Is it permissible for those suffering from diseases which unfit them to procreate children?

Where economic considerations, or considerations of health or disease, dictated avoidance of pregnancy, temporarily or permanently, should resort to birth-control be considered justifiable?

I assume that apart from any specific dictate of religion these are cases in which the *priest*, if consulted would, or should, give his approval to the line of action proposed to be taken.

One argument meets us at every turn. Birth-control is practised only among the prudent middle classes who form the backbone of all countries. The poorer classes who need it much more on every consideration of prudence, individual and collective, do not practise it. The result is that inferior stock multiplies rapidly and unchecked and the superior stock does not increase in the same proportion. The proportion of the fit in a nation practising birth-control will diminish. This argument is a somewhat exaggerated presentation of a barely possible result. *All births are not effective additions to the population.* Births minus infant deaths must be counted. If the lower classes produce more rapidly, the infant mortality is much larger among them. The higher classes do not counteract the larger number of births in the poorer stock by running a race of improvidence with them but can do so only by improving their stock, giving birth to as many as they can support in health and efficiency and also conserving the health of the mother. Increasing the number of births without regard to economic or health considerations of the family and the mother, or considerations of certain disease in the offspring of the union, will neither serve the country nor the family.

BISHOP WALLER'S VIEWS

I must not omit to notice what My Lord Bishop Waller of Madras says in the "Madras Mail" of the 28th October. Anything that falls from his Lordship merits the most careful consideration. Speaking for myself I should never venture to differ from him without making the most earnest attempt to understand what he says and why he says so. I do not take man to be a mere superior animal. I recognise him in some sense as divine. If there is any danger in my case, it is that I might take man to be more, not less divine than He is, I recognise his share in creative work and in the work of Providence. The joy in creation and the self-sacrifice and unremitting care he makes and takes are not so much the result of education as of inborn instinctive nature implanted in him. No one says that the act of procreation shall not end in creation or that man should abandon creative work. The question, as it presents itself to my mind, is:—Shall man be, like the beasts of the field, without thought or choice of the fitness of the time and the place and the circumstances in which to effect his creation?

In the closing paragraphs under the heading "Way of sacrifice" it is said that the mass of the people ignore birth-control. The first question is, is it right to teach them methods of birth-control. What is stated to be the immediate result, the deterioration of the population, I have tried to show, to be an exaggerated apprehension. The last paragraph as to control and restraint and sacrifice—is it intended to suggest that abstention is the only permissible method to avoid pregnancy and death or serious illness already referred to or that the risk must be faced and not avoided?

I find it difficult to arrive at the conclusion that His Lordship really means it. To my mind the explanation is in the earlier paragraph where reference is made to the satisfaction of primitive instincts and the aviodance of irksome responsibilities, such as the care of children, school bills and all the worries of rearing the family. It is throughout an argument, a justly conceived argument, against a problem which has arisen in the west where a good section of the higher stock is altogether declining to undertake the responsibilities of motherhood, and not producing and maintaining that number of children which they can and should properly produce and maintain. That problem has not arisen in this country and will not arise for yet a long while, if it should ever arise at all. I say if it should ever arise at all, because

in this country the desire of progeny is so strong in every section that control of excessive procreation is the problem, not the need, to encourage procreation. If the women of the higher stock in any country refuse to perform their national duty is there any way out except the education of those women to take a juster view of their responsibilities to themselves, to their country and to their God? There is no means of preventing that class knowing and practising contraception because they are either already in possession of that knowledge or can easily get it. On the other hand, should not public effort be directed to educate the lower stocks to practise contraception? If it is assumed that these can never be educated to mind either their own individual or collective interests, is it the suggestion that the remedy lies in the higher classes abandoning considerations of prudence or the demands of personal health or even the clear interests of the unborn child? There is a shortsighted and selfish care for the individual's own pleasure and there is the farsighted foreseeing care for one's own happiness and for the lasting happiness of the whole community. The argument of His Lordship is against the former; the latter case may, and often does, demand birth-control. As to one remark of His Lordship about the free use of scientific knowledge for attaining ends, I feel inclined to say that if the ends be worthy and just from all points of view, high and low, and short and long-sighted scientific knowledge is God's gift intended to be used and it is the divine side of man that demands its use.

RISK OF MISUSE

It is said that a knowledge of the methods of birth control may be used for improper purposes. So may it be. There are few items of useful knowledge that cannot be so used. A certain care in disseminating the knowledge is therefore required. But just use should not be prevented or condemned merely because of the possibility of misuse.

Among the lower or diseased stocks no use of contraceptive knowledge can be excessive. And yet we hear only unqualified condemnation of birth control and no pleas for disseminating it among the classes to whom it will be useful. One cannot but feel that the repugnance comes from some source hidden under layers of accient habit and and modes of thought and we merely struggle to give it a foundation in reason. It is that repugnance that breaks out in its condemnation is unnatural and against moral laws and laws of God. It is unavoidable that we should create our God in our own image, that is, attribute to God the best opinions that our nature in its highest phase can form on all problems that wear a moral aspect in our mind.

PHYSICAL AND PSYCHIC PREPARATION

There is an important question in the background of every mind directed to this problem as to the propriety of previously preparing for sex relation. The view though rarely expressed is there all the time that there is something sordid, something unnatural, in bestowing previous thought and making the subject of prudent calculation an emotion which has incalculable racial value and should be allowed to have free play when it is on. The other view is that the mental and physical condition of the parents is a matter of great importance to the unborn child and it should be made a matter of careful choice or preparation. The lives of the many are lived as if upon the former view. I say as if upon the former view because in truth such lives are not the result of real thought. The latter view I have seen acted on in a few cases. (The case against the unwanted child, sometimes conceived in dread of pregnancy, was strongly put by Mrs. Cousins in her message read at the meeting in the Gokhale Hall). It may seem primitive and it certainly is superstitious. I have known religious people turning over the pages of the almanac and scanning it for selecting an auspicious day and hour. One very good result it the temperance of their lives. The week days to be avoided, the days of the dark and bright fortnight that were inauspicious, unsuitable conjunction of the moon and the asterisms and the days absorbed by religious rites and ceremonies secured extensive exclusions. It is possible to criticise these efforts at careful selection as securing very meagre results as compared with the haphazard mating of unprepard perents. That does not settle the question of the need for preparation. So long as the religious men do not fully appreciate the nature of the preparation needed, the absence of result in their case leads to no definite conclusion. Nor can it be said that such care as they take is of no efficacy altogether. The passage in the Srimad Bhagavata, that deals with the birth of the Divine Child, has a description of the beautiful mental uplift of the parents that preceded the incarnation.

METHODS

Avoidance of pregancy is not wholly condemned as improper. Safe periods may be chosen. The period of pregnancy is not required to be avoided. There are those to whom the instinctive behaviour of aninals points to what is natural and therefore proper. The Indian myth-maker has obviously taken a different view. That myth, early Vedic in origin, itself shows the ancient Indian's habit of allowing for normal acts.

Nobody objects to abstention or refuses to give it the first place as a means of restricting the family. It is practised and sometimes it takes curious forms. There is an extraordinarily prudent community down in the Southern district of Tanjore, among whom it is said to be fairly the rule that after two or three children the wife releases the husband from all loyalty and practises abstinence herself. Here it is man's weakness that is recognised and allowed for.

Coitus interruptus and *reservatus* involve no previous preparation. From the earliest times and in all scriptures spilling of semen is condemned as sinful. The Avesta and the Vedas contain express condemnation and attribute the vice to their religious opponents. Other religions express the some condemnation in different ways. They were directed probably against solitary vice really. Coitus interruptus was within the letter of the prohibition. Sentiment was all against it. But a certain number practise it without apparent harm. There is however the statement that it is harmful and shattering to the nerves in most cases. The final arbiter is experience and only doctors can decide it in the light of wide experience of which they must be in possession.

Coitus reservatus has somehow been held in high esteem. It is not easy. It is believed to be the exhibition of extraordinary self-control which is possible only to *yogis*. It is on the ground of its being an exhibition of exceptional yogic power that it has managed to win approbation and appreciative references in books. Its injurious consequences are much more well-attested by experience than those consequent on coitus interruptus.

Physical applicances for the avoidance of pregnancy are the things most objected to as repugnant to average sentiment. But the use of drugs is not a new thing of yesterday. Herbs have been known and are in use for ages. They are probably in their nature abortion-inducing rather than preventive.

Now that we are on prevention as distinguished from abortion, we may add that in prevention there is no destruction of life. It was held up to reprobation in ancient times because they were in need of a vast population and stimulated the public sentiment in favour of their programme by likening it to murder. It would be a disaster if all seeds became life ; there is no basis for such extreme condemnation. Right through creation much seed runs to waste. It may be man's duty to minimise the waste. To prevent it is not put in man's power and it does not seem to be reasonably demandable.

BIRTH CONTROL FOR NATIONS

There is a leading article in the last part of "The Indian Social Reformer" that birth control is undesirable becuse it diverts attention from the real preblem. It concedes the need for birth control in the cases referred to in the course of this article. But as a question of nations as a whole it seems to imply that uncontrolled births and increase of population are desirable. I find it difficult to agree and I see reason to differ from every other sentence. I cannot say that I quite grasp the nature of the problem from which birth control deflects attention and should therefore be deemed undesirable. More explanation is needed for me to understand it. I therefore do not attempt to deal with it.

There was a collection of opinion from correspondents which I thought instructive for the variety of opinions expressed.

Father Basenach has addressed the Rotarians on this question. His address contains matter, the consideration of which I reserve for another occasion.

Some aspects of Medical Ethics

(*S. N. Basu, M.B.*)

The U. P. Medical Council, in conformity with its notions of medical ethics, condemns the following as objectionable practices, for members of the medical profession :—

(1) Entering into any compact, in his personal capacity, with a pharmacist or any manufacturer or firm dealing with medical and surgical appliances or requisites, to receive a share in the profits arising from the sale of medicines prescribed, or medical or surgical appliances.

(2) Keeping an open shop, that is, one for the sale of medicines, medical or surgical appliances, etc. other than those prescribed by himself or by another registered practitioner, or styling his dispensary in such a way as to cause it to be taken for a chemist's shop, e.g., "Nelson & Co., Dispensing Chemists," etc.

(3) Taking any part in the manufacture or sale of proprietory food or medicine ; (*Proprietory* meaning sale of which is restricted by patent etc. *Concise Oxford Dictionary, 1929*).

Again on the 1st of May 1933 the U. P. Medical Council passed the following resolutions :

(1) "Resolved that this council looks with strong disfavour on the practice of medical practitioners writing their prescriptions on forms supplied by chemists and druggists bearing their name and address and advertisements."

These decisions of the Medical Council raise an exceedingly important question for the consideration of the medical profession and the Indian public generally. It is obvious that these decisions are based on the traditions of the profession in England. But these traditions have been different in India hence all principles of Ethics relating to the profession in England cannot be indiscriminately applied to India, as shown below.

What is proper and moral at a certain time in one country may be the very reverse of it in another where the conditions are different. Apart from basic principles the customs of different countries vary so largely that it is difficult to swear by any ethical dogma as a guide for members of the same profession in different countries. Whatever may have been the custom in England, the medical practitioner in India during the Hindu and Mohammedan periods mostly examined his patients without charging a fee and in many cases gave medicines also to his clients without charging a price for the same.

In a few cases the state gave financial support to these practitioners but the great bulk of Vaidyas and Hakeems lived on the fees and presents received from their comparatively few rich clients. The cost of the medicine prepared by them was also paid by these rich clients who needed only a small proportion of the medicine so prepared. In many cases the money paid as the cost of medicine was a good source of income to the medical practitioner.

The more eminent among the Vaidyas and Hakeems used to keep a *school* where their disciples learned from them the art of treatment and preparation of medicine.

The present day system of charging fee was practically unknown. The top men in the profession sometimes did take a *Nazarana* from their patients before examining them but in a large majority of cases even they had to rely upon *Shukrana* and not *Nazarana* as the principal source of their income. The topmen, however, charged the price of the medicine which they themselves prepared and supplied to their patients. This practice with slight variations finds favour with Vaids and Hakeems on one hand and the Indian public generally on the other even to this day.

At the present time the medical practitioner, who has been trained according to the European methods, usually gets himself attached to a dispensary. If he is well-to-do he starts a dispensary of his own. In other cases he charges a commission on the medicine sold to people for whom he wrote out a prescription.

Manufacturing or selling of medicine is just like any other business and it is open to citizens of every community to start a shop for selling the same. Similarly it is open to any group of citizens to open a dispensary in partnership. Therefore the question for consideration is whether by virtue of being a doctor, a medical practitioner foregoes the right of preparing or selling or otherwise benefitting by some transactions of sale of medinine. No such ban was placed on the medical profession in the old days in this country and surely it was no offence against medical ethics or professional morality to prepare or sell medicine for a medical practitioner of the old days. But it may be urged that the old order has changed and that the present day doctor charges a fee before examining a patient and prescribing for him and therefore the imposition of a new obligation on the profession not to profit in any shape or form by preparation or sale of medicine is justified. The reply to this contention is three fold. Firstly, in India great majority of doctors do not charge a fee for examining patients at their dispensaries. At any rate excepting the topmost men in the profession nearly every doctor sees a large number of patients free every day and prescribes for them without charging any fee. What is to be his recompense for this work and why should he not be permitted to make a little profit out of the sale of medicine prescribed by him as the old Vaidyas and Hakeems did ?

Secondly, on general principles a practising medical man, is better qualified to prepare new as well as old medicines and to look after the management of a dispensary than doctors who do not practise or lay men who have not received the training and experience of a medical practitioner.

It will make for efficiency in the preparation of medicine to let qualified doctors look after it. Indeed it appears strange that the preparation of medicines should be regarded as being beneath the dignity of a medical practitioner. It is common knowledge that despite the great progress made in other branches of the medical science the Pharmacopeia remains fairly poor even to this day. It may be that the shutting out of competent medical practitioners from this branch of medical science in its every day application has resulted in the arrest of growth of this subject.

Thirdly, it is extremely unfair to forbid the earning of a commission by a medical practitioner on the sale of medicine prescribed by him. The Medical Council permits the keeping of a shop by a medical practitioner for the sale of medicines prescribed by himself or by any other registered practitioner. There is no distinction in principle between owning a shop of the latter variety and grabbing the entire profit accruing from the sale of medicine from such a shop and being interested to the extent of one commission only in the financial operations of a shop of the former variety. It is difficult to imagine how if the one is justified the other deserves condemnation. On the contrary the comparatively poorer men who take to the medical profession are thereby put under a heavy handicap. A rich man entering the medical profession may open a shop outright where his own prescriptions and those of other registered practitioners may be dispensed without a hitch and thus secure a steady income whereas a poor man, however brilliant, is deprived of the little profit he could earn by charging a commission on his prescriptions or by entering into some other similar working arrangement with the owner of a chemist's shop. It is well known that in the earlier stages of a doctor's private practice a working arrangement of the above description furnishes a no negligible part of his meagre income. A code of ethics which brazen facedly places a premium on the capitalistic enterprise of the wealthier doctors is apparently not founded on principles of justice and fairplay. And it is imperative that the code should be revised.

Apart from the injustice to the poorer medical practitioner referred to above the present code of medical ethics largely ignores the general public welfare to secure which it was ostensibly framed. Preparation of medicine is the work of a highly skilled doctor and instead of endeavouring to stop by legislation the manufacture of medicines by unqualified men the Medical Council stops all qualified doctors from preparing or manufacturing medicines.

The result of this unthinking and anomalous attitude can be observed in the baneful activities of quacks who have flooded the market with concoctions of their own. The public is not only robbed of its money but is also robbed of its health and the Medical Council plays the role of a helpless spectator to the serious evil.

The wise men who compose the Medical Council, here and abroad, have forgotten the fact that it is their own obsolete code of medical ethics which is responsible for the evil.

I therefore suggest that the U. P. Medical Council should be asked to take steps to revise the code of medical ethics approved by it on March 17, 1929.

COMMENTS

Rule No. 1. ***"Entering into any compact in his personal capacity with a pharmacist or any manufacturer or firm dealing with medical and surgical appliances or requisites ; to receive a share in the profits arising from the sale of medicines prescribed, or medical or surgical appliances."***

"The doctor cannot be an agent, a paid servant, a stockist, a share holder, or an expert adviser on commission basis or a serologist, bacteriologist, pathologist, physiologist or a research worker in a firm of manufacturers."

Since he cannot enter into any compact with a pharmacist so he cannot purchase their medicines on trade discount system ; by doing that he receives a share in the profits arising from the sale of medicines. So he cannot take any discount or commission for drugs or for medical and surgical goods he purchases from such firms,—as Tinct. digitalis, (Parke Davis), quinine (Howards), aspirin (Bayers), Vaccines (Parke Davis), etc.

He cannot be a shareholder in the Scientific Instrument Co., Bengal Immunity, Bengal Chemical & Pharmaceutical Works.

So the principal organisers and shareholders of Bengal Immunity Co., who are at the same time practising physicians, according to this rule, are guilty of unprofessional conduct.

A doctor can be a shareholder in a sugar factory, cotton mills, etc. but he cannot be a shareholder in a drug manufacturing company.

Again doctors getting their medicines from big dealers like Messrs. B. K. Paul & Co. for their own dispensary on credit or instalment system comes under this clause for they thus enter into compact with such dealers. These big firms allow a certain commission or discount on medicines supplied to small or large dispensaries owned by medical men or chemists. It is well known in business world that discount or commission is allowed by big firms and manufacturers to dealers in every phase of business, so it is also allowed to doctors who own dispensaries and is quite consistent with business ethics. Dispensing medicines and selling medicine are just like any other business, so why should a doctor be debarred from getting his share of profit for the money he invests in his dispensary ?

Again doctors engaged in Kasauli and Gurmukshavar manufacture vaccines, sera etc. (which are generally prepared in foreign countries by private firms and laboratories) and sell them to local boards, railway and military authorities ; so they become culprits by breaking the provision of this clause of medical ethics.

Rule No. 2. Keeping an open shop, that is, one for sale of medicines, medical or surgical appliances, etc. other than those prescribed by himself or by another registered practitioner, or styling his dispensary in such a way as to cause it to be taken for a chemists shop, e.g., "Nelson & Co., Dispensing Chemists," etc.

A doctor can sell medicines or appliances on his prescription or on the production of a prescription from a registered doctor. One who is not registered, but who has a registrable qualification, cannot expect his prescription to be made up by a dispensary owned by a registered doctor. He can sell a bed-pan to a man who comes fully armed with a prescription from a registered doctor but he cannot sell it to a lay man unarmed, or to a chemist who has accidentally run short of the said commodity. The only way to be within the rule is to sell them and make out one's prescription at the end of the day.

It is the general custom in this country to style one's dispensary as chemists and druggists or pharmacists and general merchants for generally one has to keep all sorts of merchandise for the facility of the people of the small town where people expect the doctor's dispensary to stock them.

Again people in India are in the habit of purchasing goods on credit and they prefer to have as few accounts as possible so would like to deal with a shop which stocks all the necessary requisites. So the doctor in India is compelled to stock them.

In my opinion the whole object of allowing doctors to keep a dispensary is to give an additional income to supplement generally the inadequate income from fees and thus allow the doctor to eke out his existence by honourable means.

Rule No. 3. "Taking any part in the manufacture or sale of proprietory food or medicine."

According to this rule Ehrlich and Hata should not have brought out 'Salvarson', nor Brahmachari his Urea Stibamine.

Again prescribing and selling medicines from one's dispensary is taking part in the sale of these proprietory drugs and foods, so strictly speaking one cannot sell them or prescribe them, however efficacious and good they may be, even at the cost of a patients' life. But what we find in general practice is that they are used and sold by doctors from the highest to the lowest in the profession. I am here appending a few names of such articles to convince you of my statement : Foods—Allenbury's Food, Sanatogen, Sionon, Mellins Food and Quaker Oats.

Proprietory drugs : digifortis P. D., glucose D. ; ostelin ray malt, ostomalt, Grimault's syrup, hormotone, plasmochin, stovarsol, anabolin, drosil, yatren, ventriculin, metatone, solganol, sanacrysin, and lopion. I have only mentioned a few whereas I can mention a large number of proprietory foods and drugs that are being used every day by doctors.

RESOLUTION of lst. May 1933 of the U. P. Medical Council :

"Resolved that this Council looks with strong disfavour on the practice of medical practitioners writing their prescriptions on forms supplied by chemists and druggists bearing their name and address and advertisements."

It is a well known fact that unless the doctor is confident that the patient is getting the proper medicine he is in great suspense and is always under the apprehension that probably the proper drug has not been served or that an old inert drug has been substituted in place of a fresh drug of higher quality. In the interest of the patient he asks his client to buy the medicines from a particular firm in which he has confidence.

On one occasion, I prescribed Allenbury's tasteless and odourless castor oil to a fastidious patient of mine. I gave the assurance of its being tasteless and odourless. I did not ask him to get it from any particular firm. He got it from a nearby Dispensary.

The next day when I went to see the patient he accused me of giving him false assurance of the castor oil being tasteless and odourless. I looked to the phial and found that ordinary castor oil had been served. I went to the firm from which the prescription was served and enquired whether it had Allenbury's castor oil and received an answer in the negative. I resented their action on which I was told that it did not matter whether the castor oil was tasteless or not.

Again recently I prescribed Hotchkis Pepermint Oil and received Pudina Oil instead.

Again Pot. iod. was prescribed in half-a-dram doses to a patient with no results. The patient was asked to get the medicine served from a reputable druggists shop, the result was instantaneous and improvement was noticed in a few days. It was then discovered that the first chemist was serving Pot. iod. of an inferior brand, so in the interests of the patient one is some times compelled to direct them to a firm in which he has confidence.

Indian Institute for Medical Research.

An appeal

Workers in India have been feeling, for some years past, the need for a Research Institute where original investigations in medical sciences could be carried out and the problems bearing on the promotion of national health could be intensively studied. Our country, it is well-known, is woefully behind other civilized countries in the pursuit of medical research and in the application of knowledge to the vital problems of raising the standard of the health and efficiency of its people. It is not strange that in India the rate of mortality is so colossal, the average span of life so short and the standard of health generally so much lower than in the countries of the West. A century ago the standard of health in western countries was not much better than that in India now, but sanitation and education, backed by organised scientific enquiries into all the problems connected with health, have resulted in a rapid and steady improvement of the health of the people. Scientific research carried on for its own sake as also with the determination of applying it, wherever possible, to the service of the community, is, we feel, necessary for raising the standard of both the health and the efficiency of our people.

It will be generally agreed that very little work has been done on those lines in this country outside the few Government Institutions, where national talents do not often find full and free play and where the work is not always intimately connected with the vital problems of national health. Nor is the number of such institutes adequate to meet the needs of our country. A truly Indian Institute of Medical Research with the object of tackling the vital health problems of the nation has now become imperative. During the last few years assurances have been received from a number of keen and able workers who are prepared to devote their lives to make this scheme a success. The objects of this Institute will be to carry on research in the medical sciences, to train a band of research workers, to apply the knowledge obtained to clinical practice and to preventive medicine, and to disseminate the knowledge of hygiene among the masses, making its services available to them either free or at a low cost.

SCHEME

The Institute will be called "The Indian Institute for Medical Research" with six departments to start with, [namely, (1) Bacteriology and Pathology, (2) Tuberculosis, (3) Biochemistry and Nutrition, (4) Protozoology, (5) Experimental pharmacology and indigenous drugs enquiry, and (6) Diagnostic laboratory and clinical work, with which the propaganda and preventive service will be incorporated]. More sections will be added as soon as sufficient funds are available.

Each department will be under a Director, assisted by a suitable staff. Adequate arrangements will be made to stimulate research by taking in a suffieient number of stipendiary and voluntary workers. The entire organisation will be governed by a Governig Body, composed of eminent scientists, representatives of various bodies mentioned in the Memorandum and a few departmental Directors. The Geverning Body will carry on the administration and will present their report at the annual meeting of Fellows and Members of the Institute. The first Governing Body will consist of the following :—

(1) Sir Nilratan Sircar, KT., M.A., LL.D. M.L,C.

(2) Mr. A. R. Dalal, I.C.S. (Retd.), Director, Tata Sons.

(3) Dr. T. S. Tirumurti, M.B., C.M., D.T.M. & H., Professor of Pathology, Vizagapatam Medical College.

(4) Dr. V. R. Khanolkar, B.A. M.D., (Lond.), Offg, Dean, Seth Gordhandas Sunderdas Medical College, Bombay.

(5) Dr. S. Subba Rao, B.A., M.B., C.M., Senior Surgeon, Mysore State.

(6) Rao Bahadur Dr. B. N. Vyas, formerly Professor of Pharmacology, Lucknow Medical College.

(7) Dr. K. S. Ray, M.A., B.Sc., M.B., Ch.B. (Edin.), Professor of Surgery, National Medical Institute, and Chairman, Public Health Committee, Calcutta Corporation.

(8) Dr. A. C. Ukil, M.B., (Cal.), M.S.P.E., (Paris), Professor of Bacteriology, National Medical Institute, and Visiting Physician, Chest Department, Medical College Hospital, Calcutta.

(9) Dr. H. Ghosh, M.B., formerly Director of Biological Laboratories. Bengal Chemical and Pharmaceutial Works Ltd,, Calcutta.

(10) Dr. N. Banerjee, M.B., Visting Physicion, Howrah General Hospital.

(11) Dr. B. C. Guha, D.Sc., (Lond.).

The funds and property of the Institute will be vested in three to five Trustees.

The Diagnostic Department will be in direct touch with the needs of the people and will try to help institutions, local bodies and medical men with the diagnosis of communicable diseases either free or at a nomial cost and will distribute biological products also at a low cost, if not altogether free. The object of developing this service is to facilitate preventive measures even

in very modest homes among all strata of society. It will also be the function of this department to arrange for educative propaganda for the prevention of diseases.

It is desired that the Institute shall provide a centre for an increasing band of research workers, who may come in as post-graduate students for whom regular training arrangements are contemplated. The institute may be affiliated to a University and may receive State aid. The Institute will also act as a consultative body for the determination of the purity and potency of sera, vaccines and drugs. Indian markets are now flooded with all kinds of adulterated and understrength products and there is absolutely no way to control or check the purity of medicines and drugs.

The results of its researches will be published periodically in the form of Transactions of the Institute.

FINANCE

Research Institutes have developed in different ways in different countries. The Pasteur Institute in Paris, which was established by international subscription, has to cover its expenses by manufacturing standardised vaccines, sera and other products. The Rockefeller foundation in America meets the expenditure of the Rockefeller Institute for medical research out of its invested funds. The Medical Research Council in Great Britain is a state-endowed organisation and supports the National Institute of Medical Research at Hampstead.

In countries like Europe and America, large donations and endowments are made for this scientific research work, which ultimately does the greatest good to the people. In our country, donations are frequently given for religious endowments. The problem of the health of the people of this country has not attracted the attention of those who could afford to spend money for charitable purposes. We believe, however, that many in this country are now realising the necessity for scientific investigation of vital problems of national health. If we succeed in raising the money, this Institute for medical research will be the first of its kind in India organised and financed by Indians.

For this country, we must choose either the endowment model or the Pasteur Institute model. The former type, though it gives the workers a more ideal environment for their thoughts and energies, is difficult to establish immediately on account of the present financial depression in the country. We are, therefore, compelled to follow the Pasteur model, as the Institute must be placed above pecuniary wants, if efficiency in research is to be aimed at.

It has been calculated that the initial expenses for starting such an Institute will be at least Rs. 1,25,000/- for fittiings, equipment and first year's current expenses only and a recurring expenditure of at least Rs. 1,10,000/- yearly will be required for the six proposed sections.

It is hoped, however, that the Institute will be self-supporting after the first year. We, therefore, appeal to the generosity of the public only for the initial expenditure necessary to establish the Institute and to enable it to function for the first year, namely the sum of Rs. 1,25,000/-. It is a small premium to pay for the benefits that will accrue, for we would emphasize that improved health means increased longevity and capacity for work, and necessary additions to the national wealth and happiness of the India to come. Notwithstanding these days of depression, we trust that public response will be prompt and generous.

Donors may help the Institute in various ways—they may (1) endow a department—its construction and equipment or may contribute to the recurring expenditure required for a particular department, (2) create special chairs for special investigations, (3) create scholarships for junior workers at the Institute or (4) give donations or endowments for the general expenses of the Institute.

All contributions will be received and thankfully acknowledged on behalf of the Governing Body by Mr. A. R. DALAL, I. C. S. (Retd.), 100, Clive Street, Calcutta.

All correspondences, not dealing with contributions, should be addressed to the Secretary, Indian Institute for Medical Research, 44, New Theatre Road, Calcutta.

(Sd.) Rabindranath Tagore, Madan Mohan Malaviya, P. C. Ray, C. V. Raman, Nilratan Sircar, Ramanda Chatterjee, S. Subba Rao, V. R. Khanolkar, B. N. Vyas, T. S. Tirumurti, A. R. Dalal, Gaganvihari Mehta, Kumud Sankar Ray, Amulya Chandra Ukil, B. C. Guha, Hemendranath Ghosh, Nabajiban Banerji.

Indian Medical Association Extension Lectures : 1933.

(From the Carmichael Medical College Magazine 1933 : Vol II. No. I. Page 72.)

We congratulate Drs. C. C. Bose and N. R. Sen Gupta the convenors of a recent series of lectures in the diseases of the Cardio-Vascular system. Of many useful things this young association has done this is all the more unique in that such an attempt though overdue was long unknown. It has afforded an excellent opportunity to all, students and practitioners alike, to know the subject to the full, and to its recent developments. No part has been

omitted and each part has been placed in eminent and efficient hand. One can well hope that it will be a monumental work embodied in it, as it is natural to expect, will be characters which are so peculiarly Indian. We are anxiously awaiting the publication especially in a book form so that it reaches all hands. Similar lectures might be chosen in future so that it will comprise in time diseases of all parts of the body. It is funny indeed and regrettable too that in spite of so many eminentia we are to read books written by foreign authors only whose writings are characterised as it ought to be by characteristics found in their own land.

If it is a fact that each generation builds on the shoulder of the generation behind it, is it not proper and natural to expect that these eminent men should convey their stores of previous experience to the pages? Is it not high time that one should cease to look to the other side of the sea for every and any development and is it not high time that it should give out its own ideas which the other countries will be equally eager to know. We are of course conscious that each laboratory, each country depends on others but why should one be all idle ?

Current Medical Literature

MEDICINE

Diabetic Coma

O. L. E. DE RAADT (Wiener. klin. Wschr. No. 20, 1933, Ref. Ars. Med. No. 11, 1933) points out that with diabetic coma insulin alone is not sufficient: it is imperative to combine it with treatment by alkalies (sodi bicarb, intravenously until the reaction of the urine becomes neutral or slightly alkaline). Insulin only counteracts the abnormal formation of acids in the body but does not influence the acidosis which already exists. The insufficient elimination of chlorides in the urine of camotose diabetic is not due to a lack of NaCl in the tissues but to a lack of alkalies which leads to the retention of NaCl. Whenever acidosis is not compensated by the kidneys it is compensated by the extra-renal formation of ammonia. During the coma, the ammonia content of the blood is markedly increased. The coma is not an acid but an ammonia poisoning; this explains the high degree of lipoidaemia as a consequence of the effect of the ammonia on the lipoids of the cells. A liberal supply of alkalies is immediately followed by the renewed elimination of Cl with the urine and by the immediate cessation of the external formation of ammonia. According to BRENNHOLD, only 50% of comatose diabetics over 60 can be saved by insulin alone whereas KUHN and WITSCHER have not lost a case through coma for years, due to their combining insulin with alkalies.

J. C. B.

Acute Pulmonary Oedema

M. DOUMER (Jour. des Practiciens No. 45, 1933, Ref. Ars. Med. No. II, 1933). advocates, in the treatment of acute pulmonary oedema, only a few sensible measures above all blood-letting. Even the withdrawal of only 300 c.c. affords marked relief. With debilitated persons, however, cupping is preferable; the application of 8-12 cupping glasses on the scarified skin of the back is promptly effective. The writer recommends following up the venipuncture by an intravenous injection of O. 25 mg. Ouabaine (Ouabaine is a French preparation of *strophanthus* which is said to be less poisonous than strophanthine and is also available in ampoules for intramuscular injection.) If intravenous injection is not feasible a corresponding ampoule may be given iutramuscularly. The physician should stay with the patient after the venipuncture and injection. If there is no relief in 30 minutes he may give morphine hypodermically. Since, however, just with pulmonary oedema, fatal results have been observed after only O. O1 G. morphine, it is advisable not to inject more than 4-5 mg. Nitroglycerine and nitrate of amyl, which are often recommended, may, owing to their vasodilator properties, reinforce the existing pulmonary oedema and are therefore not indicated. When the acute attack has passed, the patient must still be kept strictly in bed on a very light milk and vegetable diet. The Ouabaine injections should be continued for a few days; patients with a diseased heart should be given digitalis in very small doses for several months. Tinct. belladonnae is also said to have a good effect in cases of weakness of the left ventricle with accompanying gastric disorders. As regards prognosis, it should not be forgotten that sudden death has been known to occur fairly often, even after weeks or months.

J. C. B.

Appendicitis and Influenza

W. WACHSMUTH (Klin. Wschr, No. 16, 1933, Ref. Ars. Med. No. 11, 1933) draws attention to the fact that influenza may give rise to abdominal disturbances that closely resemble the aspect of acute appendicitis; temperature of of 100° to 104°, acute pain in the region of the appendix, board-like hardness of the abdominal wall and vomiting. Numerous cases have been

reported in which operation was performed on persons suffering from influenza on the grounds of the symptoms described and in which the appendix was found to be quite unchanged. The surgeon is thus faced by a dilemma, for whereas operation may involve danger for a patient suffering from bronchitis it is, of course, on the other hand, a serious risk to fail to operate in a case of appendicitis. Where there is a doubt it is better to operate. The writer has devoted special attention to this question and has discovered some practically infallible signs for differential diagnosis. Pseudo-appendicitis due to influenza shows no leukocytosis. Genuine appendicitis is accompanied by pronounced leukocytosis, (12,400-15,000) without any increase of the lymphocytes (10-21%). The abdominal pain in influenza is chiefly due to two factors ; neuralgia in the part of the body governed by the 11th and 12th intercostal nerves and haemorrhage into the abdominal muscles, especially the recti, resulting from severe cough. If intraneural anaesthesia with the use of novocain is made in the axillary line from the 8th rib to the iliac crest, neuralgia and abdominal pain disappear, whereas in genuine appendicitis, the deep sensitiveness on pressure persists as in that case the pain is conducted via the splanchnic nerve and the communicating branches. Differential diagnosis was established on the basis of blood examination and intraneural anaesthesia and the result was confirmed in every case by operation or by the further course of the disease.

J. C. B.

Autohemotherapy in Malaria

LIO GIUSEPPE (Riv. Sanitaria Siciliana. 1933 Feb. 15. Ref. Trop. Dis. Bull. Dec. 1933.) records the results of his work on auto-hemotherapy in malaria in which twenty-six patients are referred to, 24 natives of Somalia and two others. All were infected by the subtertian parasite. His technique was to draw off 10 c.c. of blood from the median cephalic vein, without adding citrate and inject it (never less than 5 c.c. and usually the whole amount) intramuscularly into the gluteal region on alternate days, 4-7 injections in all, usually three injections being given after the fever disappeared. Nineteen of the 24 had no quinine, 2 were given the blood injections after quinine had proved ineffectual, the remaining three had at the same time as the injections 1 G. quinine by mouth.

In 16, the fever disappeared after the first injection, in 3 after the second, 3 after the third and 2 after the fourth. Six were given quinine after the injections were ended and 2 had quinine and arsenic ; 16 had neither.

Of the two other patients, one was intolerant to quinine ; a dose of 20 cgm,. gave rise to headache, tinnitus, blurred vision, drowsiness, vomiting, diarrhoea, cardiac disturbance and rash. Six injections were given on alternate days, as in the other cases, and the fever fell on the third. The other patient proved very resistent to the effect of quinine. For 8 days he took 2 G. daily by mouth and for 5 days he had intramuscular injections, but the parasites persisted. He was given 4 blood injections the fever disappeared after the first."

A. N. R.

The Parenteral administration of Magnesium sulphate in Hypertension

BURTON L. ZOHMAN and STERNBERG (Annals. Int. Med. Nov, 1933.) point out that a number of interesting and important papers have appeared at intervals on the physical effect of magnesium. Loeb in 1902 called attention to the depressing effect of magnesium and demonstrated its action in reducing muscular twitching. Its ability to stop the tremors in tetany in cases of diminished calcium was clearly demonstrated. From experiments upon animals it has been shown that the injections of magnesium reduce the blood-pressure in those animals but the result cannot be safely predicted to be true in the case of human beings in the treatment of hypertension. Furthermore, the pathological state which presents itself with the symptoms of hypertension is by no means a definite entity, dependent upon the same causes in each case. The varied factors which are likely to elicit hypertension include toxic states, metabolic or definitely endocrine disturbances, and finally abnormal condition of the central nervous system. Magnesium is a chemical capable of counteracting many of the forces enumerated in the complex pathogenesis of hypertension. Among these two are most conspicuous—its ability to relax the smooth masculature and its sedative effects upon the nervous system.

In the experiments of the authors during the past year at the King's County Hospital in a series of 50 consecutive cases of hypertension, the depressing effect of magnesium upon the nervous system of the patient was of value. The study of the cases was conducted from two points of view (1) the effect of magnesium sulphate on the blood pressure, (2) the effect of magnesium sulphate on the subjective symptoms of the patient.

The authors conclude that the parenteral administration of magnesium sulphate had a distinct effect in reducing the systolic pressure in 40 cases of the series of 50, and the diastolic pressure in 25 cases of the same series. The effect lasted for a period of at least two weeks.

The parenteral administration of magnesium sulphate had a distinct ameliorating effect on the symptoms of hypertension, *viz.*, headache,

vertigo, insomnia, hot flashes, loud noises and nervousness.

The authors used a 2½% solution of chemically pure anhydrous magnesium sulphate in triple distilled water injecting 0·035 grm. per kilo of body weight.

A.N.R.

Studies in Black-water Fever

U. BRAHMACHARI, P. BRAHMACHARI and R. BANNERJEE (Amer. Jour. Trop. Med. 12, 117, March, 1932.), carried out experiments *in vitro* to determine, if possible, whether there was any difference in the behaviour of the erythrocytes to solutions of quinine, in persons in whom black-water fever developed, and in those in whom it did not develop. Also, to determine whether there was any difference in vulnerability of the erythrocytes to quinine in persons in whom black water fever developed before, during and after haemoglobinuria.

They found the erythrocytes, in cases of black water fever following the administration of quinine, slightly more vulnerable to quinine than in normal persons, but not suffciently to account for the black water fever. In patients in whom black water fever developed they found no difference in the behaviour of erythrocytes to quinine, during or after haemoglobinuria.

A.N.R.

SURGERY

An Investigation of Cases of Haematuria

R. K. DUBENHEM, (Brit. Jour. Surg., July, 1933. Ref. The Bombay Med. Jour., Oct., 1933.), has compiled the results of 742 cases of haematuria, which attended the London Hospital during the year 1924—30.

In course of the investigation it was found that haematuria is much more common in men than in women—2 to 1.

Common causes :—

(1) Inflammatory conditions of the genito-urinary tract are the commonest causes in women,

(2) Papilloma or carcinoma of the bladder is the commonest cause in men.

In men when haematuria is the only symptom, there is 2 to 1 chance that it is due to papilloma or carcinoma of the bladder.

When age is taken into consideration it is found that,

(1) In both sexes inflammatory causes and calculi are the commonest causes of haematuria during the first four decades of life.

Haematuria during the first two decades of life is rare.

(2) Neoplastic conditions, in both sexes begin to appear during the fifth or sixth decades.

(3) The prostate appears to be responsible in the sixth and seventh decades.

Cases of unexplained hematuria occur at all ages and in both sexes.

If nothing abnormal can be found on examination, the prognosis is good.

The various conditions which are believed to be the causes of essenttial haematuria according to Bumpus are ; nephritis ; chronic passive congestion ; dilated veins or varix papillae ; blood dyscrasias.

A. N. R.

OBSTETRICS AND GYNAECOLOGY

The treatment of acute pelvic inflammation

JAMES M. PIERCE (Jour. Med., Nov. 1933) points outs that the most common causes of acute pelvic inflammatirn are the gonococcal and steptococcal infections.

Regarding diagnosis and treatment he emphasises on the following points :

1. 75 per cent of all pelvic inflammations are gonorrhoeal. Diagnosis is made from the history and evidences of primary foci in the Bartholin's and Skene's glands and the cervix. In 70 per cent of these cases pus becomes sterile if enough time is allowed. A high percentage of acute pelvic inflammation will heal if left alone. The mortality rate in operation upon the defferent cases is much less than in operation upon the acute cases, a ratio of 1:4.

Complete rest is absolutely essential along with sexual rest. A bland diet, mild cathartics, heat or cold to the lower abdomen complete the symptomatic treatment.

In the sub-acute stages foreign protein (milk) injections to increase the leucocyte count may be used. Also diathermy may be used to promote better circulation and more rapid absorption of the exudates in the pelvis.

2. Streptococcal infection usually follows abortions, labour, or intra-uterine instrumentation. The organism may enter the pelvic tissues through a cervical laceration, through the placental site or directly through the uterine wall. The results are either a diffuse parametrits and peritonitis or pelvic thrombophlebitis. Symptoms of the infection are chill, high temperature, rapid pulse and prostration, plaster-of-paris type of

pelvis. The peritonium is secondarily involved depending upon the virulence of the infection.

If the patient does not die of peritonitis, pelvic suppuration will occur and pus will collect in the posterior *cul-de-sac.* The abscess is then drained per vaginum. Thrombophlebitis results from the infection of the placental site. In these cases femoral thrombophlebitis and pulmonary embolism are common complications. Frequent manipulations and examination are very dangerous and should be discouraged.

In these postpartal infections, the treatment should be supporting, e. g., (1) complete rest (2) blood transfusion, 250 to 300 c. c. (3) glucose intravenously (4) fluids (5) high caloric diet (6) good nursing care (7) sera (8) stay out of the uterus.

In post-abortal cases, the treatment should be the same unless there are the retained products of the conception which should be carefully removed with the finger or a dull curette or placental forceps. To supplement what has been said regarding surgical treatment in connection with the gonorrhoeal infection, it is reported that excellent results are obtained when operation is done upon acute cases by experienced and exceptional operator. This result, however, cannot be duplicated by the average surgeon.

POLAK advocated putting the pelvis at rest by temporary sterilization dose of X-ray. But few Roentgenologists will guarantee that the dose will be temporary; so this treatment should be used with great discretion.

POLAK advises "Never disturb a local focus post-partum as long as the patient shows improvement unless there is evidence of localised pus."

A. N. R.

OPHTHALMOLOGY

The Value of Internal Medication in the Treatment of Cataract

F. I. BATEMAN, AND T. H. EAMES. (The Eye, Ear, and Throat Monthly Dec. 1933) write that the structure of the pathological crystalline lens suggests the possibility of preventing the extension of cataractous process by the internal medication in as much as the senile cataract is at least a local manifestation of the general process of sclerosis. They say that on investigation for over a period of 3 years they have found that the process may not only be arrested but that resorption of some or all of the cataract is possible.

A general method of medication has been established which is modified or augmented according to the requirements of the individual. "A consideration of the fundamental medicine follows. Thyroid (whole gland including parathyroid) is employed for its favourable effect on the cataract, increasing the metabolic rate and decreasing permeability of ths lens capsule, as well as for the effect of its parathyroid content in regulating the plasma calcium. Dosage in most cases has been gr. 5 once a day." The next drug used is Nitroglycerine usually given in doses of gr. 1/200 to gr. 1/50 T. I. D. and greater and lesser amounts are given as occasion requires. The effect is a general one; and the local effect occurs in the vasodilation of the vessels of the ciliary processes, thus promoting an increased blood supply to this region, from which the lens derives its nourishment in the form of lymph. Another drug is Potassium Iodide, in saturated solution, given in doses of 5 drops after meals for its alterative action as well as for its effect on newly formed cataract opacities, the resorption of which it seems to promote.

Lastly, particular attention is paid to the general health of the patient. With this end in view cod liver oil is administered for its influence on general nutrition and also for its vitamin A content.

Laxatives such as, pills of aloin, strychnine and belladona should be used from time to time as these patients often suffer from some degree of constipation.

Internal medication was used in the treatment of 20 cases of cataract. Five were discharged with 20/20 vision in each eye; four with visual acuity of 20/30 or above in the better eye, and one case did not respond. The remaining ten cases presented varying degrees of improvement in cataracts and vision, proportional to the degree of general health and the extent of the cataracts when treatment was instituted. Early diagnosis and treatment are productive of best results.

A. N. R.

THERAPEUTICS & PHARMACOLOGY

Persistent pain, particularly that of Cancer, treated with Cobra Venom

In 1929 DR. MONAE-LESSER, of New York, (Rev. Therap des. Alcaloides, Oct., Nov., 1933.) heard of a strange case of a Cuban leper who was bitten by a *tarantula.* As a consequence of which the pain and nervous symptoms, so troublesome in leprosy, were soon relieved.

At about the same time DR. Day of New Orleans, noticed in a cancerous patient bitten by a serpent, a diminution and subsequent disappearance of the carcinoma.

These facts led DR. MONAE-LESSER to experiment with the venom of the rattle snake and that of the cobra, upon Dr. CALMETTES advice, in France, in PROF. GOSSET'S Hospital service. Coincidently, PROF. LAIGNET-LAVASTIN with DR. KORESSEOS, was making similar researches.

The second group of doctors published first with the history of six patients that "The cobra venom is a potent analgesic in inoperable cases of cancer and the effect is more durable than that of morphine. One injection 1/10 mgm. every 8 or 10 days suffices to maintain a painless condition of the patient.

DR. MONAE-LESSER who continued his experiment with 115 cases taken at random published his conclusions as follows :

1. "The pain usually lessons between the fourth and fifth injections. These results are appreciable even in cancer of the prostate, of the spinal column and of the vulva. They are, however, negative in advanced lesions of the bladder, rectum, uterus, pylorus, liver and pancreas.

2. Among the cases of retrograde metamorphosis and healing of tumours a few is mentioned here :

(*a*) A cancer of the tongue, treated in 1930, healed in July 1932.

(*b*) In an ulcerative cancer of the breast the nodules disappeared and the lesion healed after two years' treatment".

The authors believe that treatment with cobra venom is useful for treating all pain, especially that of benign or malignant tumours the growth of which is curbed by this medication.

DR. CALMETTE'S interpretation is that the anaesthetic property of this venom may be explained if we consider its special affinity for certain phosphatides constituents of the nerve cell, particularly lecithin.

Dosage : DR. CALMETTE recommends 1/80,000 solution which is dosed in mouse units (the minimum toxic dose for a mouse weighing 20 grams) There should be given at first 2½ units then 5, followed by 10, 15, 20 or more, in subcutaneous injections every three or five days.

A. N. R.

Alcohol in the treatment of Septicemia

HAMBERGER and GUERIN (as quoted by Bom. Med. Jour, Oct. 1933.) recommend intravenous injections of alcohol in cases of grave septicemia which fail to respond to the usual treatment. Acute and prolonged septicemias are amenable to this line of therapy regardless of the type of organism isolated by the blood culture but in order to be successful they emphasise the early start of the treatment.

They use 33% alcohol in dextrose solution and inject any quantity up to 200 c.c. The syringe and needle are coated with paraffin and care is taken not to aspirate blood into the syringe. The injection is made slowly. Pain felt along the vein disappears in a few minutes ; thrombosis is rare ; redness on the face, sweats, gaiety or sleepiness occur only if large doses are used. The most opportune moment is during the chills that are experienced by some patients. The results are controlled by watching the temperature which usually comes down by lysis and the blood culture which becoms negative."

A. N. R.

The Lobelin treatment of Urticaria

E. MOSER, Schaffhausen. (Schweiz. Med. Wschr., No. 39, 1932, Ref. Ars. Med. Jan, No. 1 1933), tried on himself and on six cases in his private practice, the Lobelin treatment of urticaria with good results. Half an hour after the injection of 0·01 (in the case of a 12 year old lad 0·005) of Lobelin, all the efflorescences disappeared and with them the tormenting itching. This harmless remedy proved unsuccessful in only one case. The author, who had been suffering from urticaria from childhood and has tried everything possible for it, had another severe attack in July 1931, which again promptly receded on 0·01 Lobelin. Since then, strangely enough, no more attacks have appeared."

A. N. R.

PEDIATRICS

Peptic Ulcer in Children

R. L. J. KENNEDY (Jour. Ped. 2 : 641, June, 1933 ; Ref. Med. Times, Oct., 1933) notes that duodenal ulcer occurs at all ages of infancy and childhood. Ulcers in infants in the first years of life are usually acute, and the chief symptom is melaena. After that age chronic duodenal ulcer may be present ; the clinical picture may be characteristic, like that in adults, or indefinite and confused so that diagnosis is difficult. The author reports 6 cases of chronic duodenal ulcer in children four to eleven years of age, treated at the Mayo Clinic. In 2 of these cases the clinical picture and roentgenological findings were typical at the early ages of four and six years respectively. Roentgenological examination is the best single procedure for diagnosis of duodenal ulcer in children but even this may fail to indicate an ulcer when present, as in one of the cases reported. Duodenal ulcer should be sought for in children who have indefinite chronic or

recurring abdominal pain. Treatment may be medical or surgical as in adults.

J. C. B.

Auricular Fibrillation in Childhood

S. F. JENKINS AND N. OWENS (Arch. Ped. 50: 479, July 1933; Ref. Med. Times, Oct., 1933) note that recent studies have indicated that auricular fibrillation is more common in children under ten years of age than is commonly supposed. The case reported by the authors occurred in a negro girl ten years of age when she came under their observation. She had had frequent attacks of rheumatic fever since the age of two; and had cardiac symptoms four years later. At the time of admission there was auricular fibrillation, but no marked symptoms of congestive heart disease; the diagnosis was mitral disease. After ten days' rest in bed quinidine sulphate was given in increasing daily doses up to 30 grains the tenth day; a total of 104 grains was given before regular sinus rhythm was established. At this time a fine urticarial rash was noted on the chest and the drug was discontinued for a few days, then given again in gradually diminishing doses. The patient when discharged had a regular, although rapid heart rate; she maintained a normal sinus rhythm and felt well for five months without further medication. The fibrillation developed again; quinidine sulphate was given, but was not well tolerated and did not render the heart rhythm normal for more than a few hours. The patient developed symptoms of congestive heart disease. In this case, therefore, the use of quinidine sulphate, while at first successful in controlling the auricular fibrillation, had no lasting beneficial effects.

J. C. B.

Roentgen-Ray Treatment of Inflammatory Processes in Children

L. LIEBENAM and H. SCHOENFELD (Monatschr. f. Kinderh. 58: 104, June 14, 1933; Ref. Med. Times, Oct. 1933) report the treatment of various types of inflammatory processes in children with the Roentgen rays at the Leipzig University Children's Clinic. For localised processes, a 15 per cent erythema dose was used; for more extensive lesions a 3 to 5 per cent erythema dose. Of the 573 cases treated, 328 were cases of non-tuberculous acute and sub-acute adenitis, involving chiefly the cervical lymph glands. In these cases results were excellent; in nearly 50 per cent the inflammation and swelling receded without suppuration. In acute osteomyelitis, the Roentgen therapy was ineffective but chronic osteomyelitis usually responded well to the treatment.

J. C. B.

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(Vol. III, No. 3, November, 1933.)

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